



FRIDAY, FEBRUARY 8.

Contributions.

The Committee on Uniform Signals.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In a communication published in the issue of your valuable paper of Feb. 1, on the subject of "Uniformity of Signals," there is an implication of unfairness on the part of the Chairman of the General Time Convention in the appointment of the Committee. If the gentleman who wrote this communication had been present at the Convention he never would have raised this question. All those who were in attendance will see at once from his communication that he could not have been present. Personally, Mr. Wright needs no defence.

No statistics as to the code of signals in use on the several roads had ever been published, except in the case of whistle signals, previous to the time the Committee was appointed, and it is absolutely certain that the advocacy or adoption of any particular system had no influence whatever in the selection of the Committee. Mr. McCrea originated in the Convention the movement in favor of the adoption of a uniform system of train signals, and apart from his widely recognized fitness for the position, under all ordinary principles of parliamentary courtesy, his selection as chairman naturally followed.

As to the danger likely to result from a change from one system of signals to another, the writer will find, if he chooses to investigate the subject, that this has been done many times on railroad lines in this country without accident resulting therefrom. Frequent accidents now occur from a diversity of signals in many sections of the country where several roads use the same station and yard.

Your editorial remarks on the subject sum up the matter admirably. "Whether the proposed code is the best one is what the railroad men should discuss. It is not the committee, but the code, they are asked to adopt."

FAIRNESS.

Annual Passes.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The sweeping decision of railway managers in refusing passes to all but officers of railway companies in operation sometimes acts very ungenerously on a class of men who have been large contractors, built their hundreds of miles of roads, and by misfortune or by retirement or other causes have ceased to remain in the railroad business, and especially that class of men who are working up new enterprises, to be put off the train as soon as the road is built. If it were not for these pioneers in the railway business, many an upstart would be out of employment. He who trudges along on his weary road, spending his own money to build a road, doing all of the mean, hard work for some official to treat him with contempt after the road is built, and he in an important position, is not of that generous spirit which actual contractors should meet with. There should be a fair discrimination made by officials, who generally are men of broad views. The writer has occupied nearly every position in railway service, from contractor to president, and a case came under my notice a few days ago that made me feel like writing this article. I think no man in the railway world should hold a higher position among them than he who has actually constructed a road, commencing it with an idea and carrying it through to operation and to success. But to have a man "set down" on by a snob of a manager—it's just mean enough to be noticed.

[This letter well illustrates the feeling which many have that they belong to a privileged class, who are entitled to be carried over the railroads at the expense of the owners. This would be astonishing were it not so common, and had it not been developed by the vicious practices of the railroad companies themselves. Their officers have given passes for all sorts of reasons, until finally any man who has worked in any way for a railroad, has bought anything of it or sold it anything, who is acquainted with a railroad officer or a railroad officer's family, thinks himself wronged unless he is given free passes. The man who builds a grist mill does not expect to get his flour for nothing, nor does the one who constructs a factory ask for free cloth, or furniture, or tools. They are paid for their work once for all, and pretend to no lien on its further production. As for gratitude for such favors as free passes, that disappeared long ago; and the official class, whom at one time the railroad companies may have hoped to influence in their favor by their "courtesies," also look upon passes as their right, and the companies fear to stop issuing them to such people, because many of them would look upon it as an outrage, and change their indifference to active hostility. Thus the companies which at this day would like to become virtuous, find their former vicious practices, or those of their fellows, have put great obstacles in the way. The more closely the granting of passes is limited, the better will it be. Doubtless they may be used to advantage to keep up a good feeling on the part of employees—to render them a considerable service at little cost to the road—but it should be distinctly understood in other cases that transportation is only given for what has money value, and in proportion to the value, and that there is no class entitled to the privilege of riding free.—EDITOR RAILROAD GAZETTE.]

Standard Time Fighters.

It looks very much as if the mayor of a certain city in New England was endeavoring to immortalize his name, in company with such distinguished individuals as the Rev. Jasper of the colored persuasion, in Richmond, Va., and the cowed monks who compelled Galileo to publicly retract his previously expressed conviction that the earth revolved around the sun. The individual who fired the Ephesian Dome for the purpose of making his name famous at least succeeded in a performance on such a large scale as to make himself infamous, as probably the biggest fool that ever lived.

The following extract from the Boston Herald of Jan. 9, 1884, printed herewith, details the situation in Bangor: "The Mayor of Bangor continues to display the courage of his convictions. He started out two months ago to fight the standard time, and prevented its adoption in Bangor, where, to be sure, it makes more difference than it does here. The community is divided upon the subject. Last week the City Council voted to adopt the standard time for one of the public clocks, as prayed for by those taking their time from it. But Mayor Cummings vetoed the order. He declares that neither railroad laws nor municipal regulation has power to change one of the immutable laws of God, that the hours of noon, sunrise and sunset should occur at different periods of the day at different localities upon the earth's surface. So this 'farce styled standard time' he vetoes on the ground that it is not indorsed by one-fourth of the general public, as it does manifest injustice to all laborers and mechanics, or others who labor 10 hours per day, as it turns day into night, as it teaches wholesale falsehood and deception, and is in no way adapted to the wants of the general public, for whose interest all legislation is or should be; and last of all, as only 16 persons out of 16,000 or 17,000 ask for it." Outside of Bangor we know of very few New England people who sympathize with its stiff-necked Mayor. He might get some aid and comfort by conferring with the pastor of the Berkeley Street Congregational Church in this city, who also opposes the standard time on the ground that it is a lie."

The man whose conscience smites him for not keeping his watch running on "true" time is in a bad way. It is the worst case of total depravity on record. Cain's feelings, as narrated in Genesis, must be trifling compared with the feelings of such a man. Cain did one foul deed, but the local time man, if his feelings are governed by the sin on his conscience must be in a perfectly terrific frame of mind. Only when he is asleep in bed can he consider himself moderately sinless, and not even then should he chance to turn over and rest on a different spot. For a lie is a lie, be it big or little. Midshipman Easy's nurse, to be sure, made the excuse for herself that it was "such a little one," and perhaps our local time man endeavors to solace himself in the same way, but it won't do. Supposing his watch to be set with perfect accuracy on mean solar time at the point upon which he rests before he rises in the morning (his centre of gravity or gyration must be definitely ascertained for this purpose), every time he moves 1,000 ft. east or west he must change his watch one second or its time lies to that extent. It follows that for every 100 ft. it lies one-tenth of a second, for every 10 ft. it lies one-hundredth of a second, for every foot one-thousandth of a second, and for every inch one-twelve-thousandth of a second. To be sure, it is "such a little one," but so was Sarah's. Even such fractions would equal years in astronomical calculations.

Moreover, if he stands as motionless as Bartholdi's Statue of Liberty he lies in spite of himself if he believes in the literal meaning of the text that the sun was set to "rule the day." No watch has ever been invented that will keep true solar time. It follows, therefore, that "mean solar time" is an arbitrary standard after all, and the only question for individuals to decide is which standard is the most convenient for use. The few individuals who prefer "mean local time" have, of course, a right to indulge the idiosyncrasies of their own minds, but their experience will be somewhat like that of the jurymen in having to deal with forty or fifty millions of obstinate people who disagree with him.

Why should not our local time friends govern themselves by the latter part of the text above referred to, which says that the sun was set to rule the day, and the moon to rule the night. If they should conform to the latter literally, and we do not see how they can logically escape doing so, it would be but a trifling aggravation of a mild and harmless form of lunacy after all.—Official Guide.

An Englishman's Charges Against American Railroad Employees.

The baggage arrangements are in their inception among the principal conveniences of American travel. The voyager from New York to San Francisco can, without trouble or expense, check his baggage forward from town to town, picking it up where he pleases. Sometimes, it is true, he picks it up in several pieces, and many a family arriving at San Francisco have had their opinion of the convenience of the American system sorely modified as they stood by the wreck of their baggage. An American railway porter treats each individual piece of baggage as if he owed it a personal grudge. Easy as it may seem to take the lightest and frailest boxes as the basis of a pile, and then bring down upon them the sharp, iron-bound edges of a Saratoga trunk, it requires a good deal of skill and practice so to deal with whole carloads of luggage. Yet I have never seen at any station along 4,000 miles of railway a single instance of failure. An English railway porter handles baggage with comparative kindness, for it represents to him sixpence or a shilling. Tipping not being the practice in America, the railway porter has nothing to look for or to hope for, and accordingly takes it out of the baggage.

This same absence of tips is doubtless responsible for the brusqueness, frequently reaching the stage of downright rudeness, which marks the manner of all with whom travelers have to deal at American railway stations. Ask a porter or depot superintendent (if you can find one) from which of the confusing lines a particular train is to start. "How?" he growls, turning upon you a frowning, indignant face, as if he thought he had heard you ask him to lend you five shillings. You repeat the question, and he, turning on his heel, pitches over his shoulder a monosyllabic reply, which you may or may not catch. In any case, it will be all you'll get. This is not a reference to an exceptional experience. It is an unvarnished description of at least 20 approaches politely made to railway officials between New York and San Francisco. At only one town did I meet with an employee whose manner answered in any degree to the courtesy and willingness to oblige of a corresponding official at an English railway station. The exception—I gratefully and admiringly record it—was the station-master at Kansas City. The "tip" system, against which English railway directors rigorously enforce penalties, has its abuses; but sometimes, wandering forlornly in search of my train at a large railway junction, I have thought tenderly of the English railway porter, with his right hand dropped at his side and conveniently hooked

lest peradventure the obliged passenger should want to drop a shilling in it.

Perhaps in England we are too much in the habit of relying upon the friendly and officious porter, who not only sees your baggage into the van, but conducts you to a carriage, and sees you safely and comfortably seated. But if such intervention is desirable at an English station, with its well defined platform, its warning bell, and its hosts of attendants, it seems absolutely indispensable in an American depot (pronounced deepo), which is simply a wilderness of rails level with the waiting-rooms. Instead of a train being drawn up to a raised platform, as in England, it is halted in various positions on the broad level, unguarded highway, oftentimes either in the middle or at the far side. No attempt is made to see that passengers who have paid for their tickets start with the train. "All aboard!" the conductor confidentially observes to himself, and thereupon, without warning whistle or sound of bell, the train slides out of the station with whatever proportion of passengers may chance to be seated at the moment, or in the frantic rush which follows may succeed in jumping on. "Don't get yourself left," a phenomenally friendly conductor said to me at Ellis, as I stood on the platform two seconds before the train moved on. That way of putting it exactly represents the situation. If a train over an hour or two late pulls up at a roadside station, and, presently moving off without a warning note, leaves a passenger behind, he has "got himself left."

This brusqueness in railway places is a reflection of the national manner as met with in the cars and on steamboats. "How?" or "What's that?" is the invariable response made to a question, however softly put by a stranger on the cars. It is uttered in a peculiar, sharp, snappish tone, while your interlocutor is looking you up and down, from hat to boots, with suspicious, inquiring glance. I do not think anything unpleasant is meant by this. The American, when you know him, is among the most friendly and hospitable of human beings. But his manner on the cars or in the streets is apt to convey a false impression to the foreigner. It sometimes happens even after the unpromising conversational start of "How?" or "What's that?" that the fellow-companion on a car becomes very friendly and sometimes entertaining. This is most frequently the case on long journeys, where, having observed your habits and formed an opinion of your character, the conclusion is arrived at that you don't mean any particular harm.—Correspondence London Daily News.

American and English Freight Cars.

We quote the following interesting comparison from an article in *The Engineer*:

The small and decreasing cost of transport by freight train in America has lately excited much interest and emulation in this country. The peculiar construction of the freight cars is probably one of the many factors that contribute to make carriage by rail so cheap in a country where wages are high, and steel, iron, and even coal are dearer than in England. Most articles of freight in America are conveyed in box cars, which have rather more than double the cubic capacity of an English covered wagon. The full load, which a few years ago was 20,000 lbs., has been increased to 40,000 lbs., and even to 50,000 lbs.; while the average weight of the car itself has been increased only from 20,500 to 22,000 lbs. The average weight actually carried in a loaded car on the Pennsylvania Railroad has increased from 20,280 lbs. in 1877 to 24,620 lbs. in 1881, though, of course, a large proportion of old and light cars were still running. The following comparative table shows clearly the relative results attained with typical vehicles for the conveyance of merchandise. The average load is in each case the average weight carried, whether loaded or empty, and not, as above, the average weight carried when loaded. The pressure on the journals, etc., therefore, represents the average results under all circumstances:

	English lbs.	American lbs.
Average weight of vehicle.....	11,000	22,000
Average weight of lading.....	5,250	16,000
Total average weight.....	16,250	38,000
Deduct weight of wheels and axle..	3,700	5,800
Load on journals.....	12,550	32,200
Length and diameter of ditto.....	8 in. by 3 3/4 in.	7 in. by 3 3/4 in.
Area of bearings, number by length by diameter.....	112 sq. in. 112 lbs.	210 sq. in. 153 lbs.
Pressure on bearings per sq. in.....	112 lbs.	153 lbs.

The figures given above are deduced from careful observations on English lines, and reports, etc., of various representative American roads, and may, therefore, be accepted as fairly accurate. They exhibit pretty clearly the main results of the differences in design between English goods trucks and American freight cars. It will be noticed that though the gross weight of the American vehicle is just double that of the English, the average load is three times greater. Excluding the wheels and axles in the American vehicle, the weight of the load almost exactly equals the tare of the vehicle; but in England, the weight of body, framing, springs, etc., exceeds the load by 38 per cent. This great difference is probably due to the fact that the materials are so well disposed in an American freight car that great strength is attained with a moderate weight. The sides form a deep truss, the depth being about 1/2 of the span, and the bottom is also strongly trussed, and, owing to the central buffer system, needs little or no diagonal bracing in a horizontal plane. Two English goods trucks have eight buffers and four draw-hooks, with their accompanying gear, against two central buffers and four "dead-blocks" on an American freight car of greater cubic capacity. The saving in wrought-iron hinges, knees, corner plates, etc., is also considerable, while the American freight car bogie, with its spiral springs and axle-boxes bolted to the bogie frame, weighs little more than the corresponding axle-guards and plate springs of an English wagon. The smaller number of doors, ends and head-stocks also reduces the comparative dead weight of the longer vehicle. The comparison is still more unfavorable if the typical English vehicle be represented by a covered wagon instead of an open truck, protected by a tarpaulin. The dead weight, excluding wheels, is then more than double the average paying load, instead of being equal to it, as in American practice. This great discrepancy is not due to weakness, as an examination of freight cars in traffic and in the repair shop shows that the bodies and frames of American box cars stand shunting and rough usage fully as well as our own. The medium-sided open cars, used almost exclusively for coal, are generally sagged in the middle, showing the value of the trussed sides of the covered cars. The depth of truss possible under the floor is in itself insufficient to support a timber-framed loaded vehicle, with bogie centres 24 ft. apart.

Referring again to the comparative table, it will be seen that the wheels and axles of the English vehicle are far heavier in proportion to the load they carry, weighing 29 per cent. of the weight on the journals, instead of only 18 per cent. as in the case of the American vehicle. This can only be partly accounted for by some 3 in. or 4 in. difference in the diameter of the wheels and 6 in. to 8 in. differ-

once in the length of the axle, and is chiefly due to the insufficient strength of the American wheels, as shown by their frequent breakage, to which reference will be made further on. The size of journal given is the largest in general use in America, and was adopted in 1879, after considerable discussion, as the Master Car-Builders' standard. Journals measuring only $5\frac{1}{4}$ in. by $2\frac{1}{2}$ in. are, however, still in frequent use. The pressure per square inch, even on the larger American journals, is much in excess of that obtained in England, and it is not therefore surprising that much trouble is experienced in America from hot boxes.

The chilled wheel, despite the greatest care and watchfulness, is very liable to failure, and comparing 10,000 American wheels with 10,000 English wheels, it is estimated that in a year 170 American wheels will have broken completely or failed in the tread or flange, 210 will be found cracked in the disc or stiffening ribs, and 14 will have cracked in the

keeping such records. The plan of doing this adopted by Mr. Wm. Buchanan, the Superintendent of Motive Power of the New York Central & Hudson River Railroad, will no doubt interest many readers of the *Railroad Gazette*.

The large chart, fig. 6, consists of what may be called a large board 13 ft. long and 4 ft. high, and divided into five large panels, one for each division of the road, excepting the Western Division, which has two panels devoted to it. Each of the panels is then subdivided into nine columns, all of which, excepting the first and sixth, have holes bored in them, which are represented by black dots in the engraving. Each division has a distinctive color, which is painted in the circles A, B, C, D and E, at the top of the

the Eastern Division in fig. 6, the second column shows the number of engines "in reserve," that is, not in use on that division. The figures at the top give the total number in reserve, and pegs, which are shown by the circles with the numbers and letters inscribed, show which engines are in reserve on that division. As white is the distinctive color of the Eastern Division the red segments on the pegs 4, 14, 15, 17 and 24 show that the engines with these numbers belonging to the Hudson River Division are held in reserve on the Eastern Division.

The third column shows the number of engines in passenger service. It will be noticed that columns 3, 4, 5 and 6 are divided horizontally into three compartments. The

Location of Engines.

Eastern Division.
ALBANY and SYRACUSE.

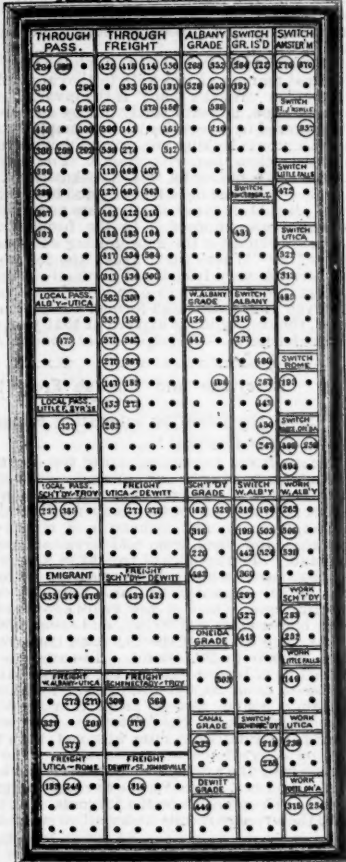


Fig. 4.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Location of Engines.

SYRACUSE. Western Division. E. BUFFALO.

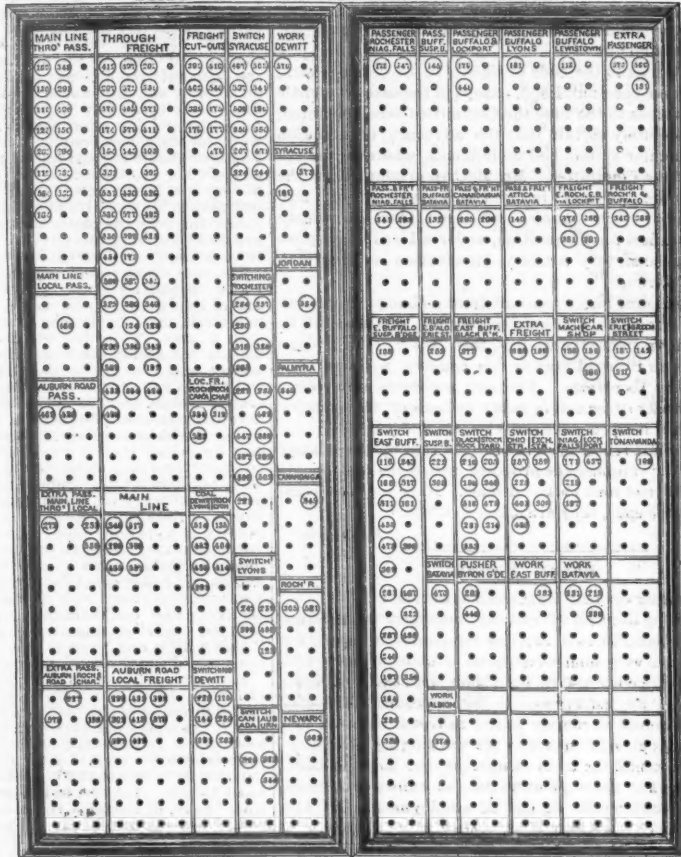


Fig. 5.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

LOCOMOTIVE CHARTS, NEW YORK CENTRAL RAILROAD.

boss. In a corresponding number of English wheels, it appears from the Board of Trade returns that 6 wheels will be found to have cracked or split tires, while a failure of the ordinary wagon wheel in the boss or spokes is almost unknown.

This disproportion seems enormous, but the figures given are at least approximately correct, and the *Railroad Gazette* commenting on the statistics on which the above figures are based, estimates that out of the 5,600,000 freight car wheels in America, 28,000 are dangerously broken every year. The wearing qualities of chilled wheels is a somewhat distinct question, which has been much discussed, but still remains in a state of great uncertainty, the estimates of the average life of a chilled wheel varying from 40,000 miles to 130,000 miles, many wheels giving way by being skidded through the chill. There can, however, be no doubt that our wheels wear longer and far more evenly, and that the 18 to 20 years' life expected of a steel tire under an English goods wagon exceeds anything ever attained by a chilled wheel. This is only partly due to the American wheel being smaller and more heavily laden; for assuming that the wear is directly as the load and inversely as the diameter on tread, an American wheel should run 80 per cent. of the mileage of an English wheel for the same amount of wear.

The heavier loads and the increased use of remelted wheels have intensified the evil, while the growing manufacture of steel tires provides a remedy, and the cheap but untrustworthy chilled wheel seems likely to be superseded by some form of elastic bodied steel tired wheels.

New York Central Locomotive Charts.

On every railroad it is important that the Superintendent of Motive Power and other officers should know the location of locomotives, the number of each class in reserve and in each kind of service, their condition, the number in the different shops under repairs, the character of repairs required and what engines have been sold or broken up. On a small road having few engines this information can be remembered, but when a line consists of a number of divisions with many engines distributed at various points, some aid to the memory is required, so that the different officers may know the distribution and condition of the locomotives. Memoranda or records are inadequate for the purpose because they do not enable any one to know at a glance, as it were, where the engines are, how many are in and out of service, etc., etc. Locomotive superintendents have therefore found it necessary to adopt what may be called a graphical form of

panels. Red is the distinctive color for the Hudson River Division, and is represented in the engraving by horizontal shade lines. The Eastern Division has white, the Western (Syracuse) blue, represented by vertical lines, the Western (East Buffalo) yellow, shown by diagonal lines, and the Harlem has black for its color.

The locomotives are represented by iron pegs shown full size in figs. 1, 2 and 3. Fig. 2 is a side elevation, fig. 1 a front, and fig. 3 a back end view of one of these pegs. A segment on which A is inscribed in fig. 1, on the outer end of these pegs is painted one of the colors enumerated, to indicate the division of the road to which it belongs. In fig. 1 this segment is shaded with horizontal lines to indicate red, which shows that the engine belongs on the Hudson River Division. A letter stamped on the segment, as A in fig. 1, represents the class of engine, the number, as

words "good," "fair," and "needing repairs" designate the condition of the engines in these compartments, and these words refer to the numbers on the left as indicated by the brackets. The third column then shows that there are engines in passenger service, of which are in good and in only fair condition. The fourth column shows in the same way the number of freight engines in service and their condition, and the fifth column gives the same information concerning the engines in switching and work service. The seventh column shows the number of engines in the shop, the upper compartment gives those requiring "general repairs" and the lower one those needing only "light repairs." The eighth column gives the same information concerning the engines in the "round-house," and the ninth those "sold or demolished" and "out of service." The figures at the head of the first



Fig. 1.

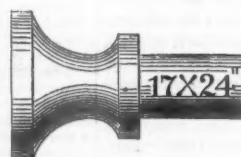


Fig. 2.



Fig. 3.

85, is the number of the engine, the letter below, the service in which it is employed. Thus P, passenger, F, freight, S, switching, and W, work. The star on the right of the lower letter shows that the engine has a Westinghouse brake pump, and a star on the left that it is equipped with driving-wheel brakes. The numbers on the side of the peg, shown in fig. 2, give the size of the cylinders, and the figures on the back end, shown in fig. 3, give the diameter of the driving-wheels in inches. These pegs are inserted in the holes in the different columns of the panels to indicate the location, position, etc., of the engines. Thus, referring to the panel representing

column give the total number of engines on the division. This column, it would seem, ought to be the last on the panel instead of the first, although, of course, it makes very little difference. The arrangement of the other panels is substantially the same as the one described.

Each master mechanic of a division has a duplicate chart, representing his division in his office. Whenever it becomes necessary to change the location or service, etc., of an engine on any division the dispatcher immediately notifies the master mechanic that such change is needed, and if approved permission is given by the master mechanic and

he also notifies the Superintendent of Motive Power, and the change on the chart is then made. Whenever extra engines are required by the master mechanic of any division he is to make requisition upon the Superintendent of Motive Power for them, giving his reasons therefor, and if the requisition is approved the Superintendent of Motive Power will order such power transferred from another division, and as soon as the power is received, the master mechanic to whom it is sent will report to the Superintendent of Motive Power, stating the number of the engine or engines, from what division

Transportation in Congress.

In the House on the 31st:

Mr. Anderson (Kan.), from the Committee on Public Lands, reported back a resolution reciting that lands were granted to the state of Kansas for the purpose of aiding in the construction of a railroad from Leavenworth to the southern line of the state, with certain specified branches, etc., and calling on the Secretary of the Interior for information as to whether the roads were completed within the 10 years, and if not, under what authority a list of lands was certified to Kansas. Adopted.

At the conclusion of the morning hour the House proceeded to the consideration of business on the House cal-

Record, and without debate the bill was passed—yeas, 259; nays, 1.

In the Senate on Feb. 4th:

The Chair laid before the Senate the message of the President, which was laid before the House of Representatives on Friday, transmitting the report of the Commissioner of Indian Affairs on the subject of right of way of the Chicago, Milwaukee & St. Paul Railway Co. through the Lake Traverse Indian reservation. Also, a communication from the Secretary of the Interior, transmitting, in compliance with a recent resolution of the Senate, a report of the Commissioner of the General Land Office concerning lands certified or patented for the benefit of railroads since December, 1875, in alleged contravention of a decision by the Supreme Court. The communication was referred to the Committee on Public Lands.

Mr. Van Wyck (Neb.) offered the following resolution, which was agreed to:

"Whereas, By section 4 of an act entitled 'An act making appropriations for the Legislative, Executive and Judiciary expenses of the government for the year ending June 30, 1874, and for other purposes,' approved March 3, 1873, it was provided: * * * No dividends shall hereafter be made by said company but from the actual net earnings thereof, and no new stock shall be issued or mortgages or pledges made on the property or net earnings of the company without leave of Congress, except for the purpose of funding and securing debts now existing or the renewal thereof; and any director or officer who shall pay or declare, or aid in paying and declaring, any dividend, or creating any mortgage or pledge prohibited by this act, shall be punished by imprisonment not exceeding two years and by a fine not exceeding \$5,000.

"Resolved, That the Secretary of the Interior inform the Senate whether the Union Pacific Railroad Co. has issued any new stock or made any mortgage pledges, lease, running arrangement or other traffic contract since March 3, 1873."

The joint resolution for the relief of the Kansas City, Fort Scott & Gulf Railroad Co. was taken up, and after the reading of the report of the Committee on Railroads, which had considered and reported it, it was passed. It provides for the payment of \$25,000 to that company as compensation for services rendered the United States, the company having returned to the United States the lands which had been granted with a view to those services.

In the House on the 4th:

Mr. Cox (N. Y.) introduced a bill to authorize the building of a railroad bridge over the Hudson River.

Mr. Anderson (Kansas) introduced a bill to prevent the sale of certain Pacific Railroads before the United States 1st bonds with interest shall have been fully paid. It provides that in case any of the Pacific railroads shall fail to pay interest due on the first mortgage bonds to which the bonds of the United States are second, the Attorney-General shall immediately institute proper proceedings for the appointment of a receiver who shall continue to manage and operate the railroad until all of the principal and interest on the United States bonds shall have been fully paid. The receiver shall pay out of the receipts and earnings the necessary expenses for operating and maintaining the road, the interest on all the first mortgage bonds, a sum equal to 10 per cent. of the whole amount of the United States bonds, and subsequent liabilities and dividends of the company in the proper order. He shall file reports of all the business of the road with the Secretary of the Interior, who shall transmit the same to Congress. If the earnings and receipts shall not be sufficient to pay the interest on the first mortgage bonds the Treasurer of the United States is authorized to pay such interest when due. In the event of such payment by the Treasurer being required a board composed of the Secretary of the Treasury, Secretary of the Interior and the Attorney-General, shall report to Congress such recommendations as to the continued operation or final dividends of the railroad as will, in their opinion, best secure the interests of the United States. In case the holders of the first mortgage bonds shall begin proceedings to foreclose their mortgage, it is made the duty of the Judge before whom such proceedings are begun to inform the Attorney-General, who shall immediately make application for the appointment of a receiver, and the proceedings shall not be completed prior to final action on such application.

New York Railroad Commission.

The following circular from the New York Railroad Commissioners is dated Albany, Jan. 28, 1884, and is addressed to the proper officers of railroad companies:

Will you please send to this Board drawings or tracings of all the truss bridges on the lines owned, leased or operated by your road, numbering the same in consecutive order, stating the location of each, and the time when built? The Board desires such drawings and diagrams as will show the construction of the various members of the bridges, with the dimensions of the same; also the floor system adopted.

It also desires a strain sheet to accompany each drawing, showing the strain on each member produced by the maximum moving load allowed upon the bridge, together with the weight of the superstructure.

The Board also desires a plan of the general standard of floor system adopted, whether for large or small openings.

The Board recommends a floor system for all openings, including cattle guards, strong enough to support a derailed truck, with guard rails to guide the wheels of the same in such contingency.

Master Mechanics' Association.

The following circular has been issued from the Secretary's office to the members of the Master Mechanics' Association:

Your Committee on the Best Material for Lubricating Valves and Cylinders respectfully ask for information in reply to the following questions:

1. What kind of lubricant do you use on valves and cylinders?

2. Have you made any experiments with other kinds of lubricants, if so please state results obtained?

3. How is the lubricant applied, by self-feeders, cup or steam chest, or through pipes from cab? Please describe the device you are using. If self-feeding cups, where is best location?

4. Have you made any experiments with self-oilers? If so please describe the different devices and give results of experiments.

5. What mileage are you getting with the lubricant you are using, to the pint or pound?

6. What results have you obtained in the wear of valves, piston, packing and glands with the lubricant you are now using compared with others you have tried?

7. What, in your opinion, is the best method of applying the lubricant to cylinders?

8. If you are using a compound that is made of several lubricants, please give proportions.

In answer to above questions please do not confine your-

received, the service and place to which it is assigned, and its condition, and the transfer of number on the chart is then made. The color on the end of the peg shows to which division the engine belongs, no matter where it may be in service. When the engine is returned the master mechanic receiving it reports such fact to the Superintendent of Motive Power, giving the number, from what division received, etc., when the transfer will again be made on the chart.

The charts, figs. 4 and 5, are intended to show the distribution of engines on the Eastern and Western Divisions more in detail than was possible on the large chart.

endar, precedence being given to bills reported from the Committee on Public Lands.

The first bill taken up was that declaring forfeited certain grants of land made to certain states to aid in the construction of railroads. After some debate and the voting down of an amendment the bill was passed.

The next bill on the calendar was that declaring a forfeiture of lands granted to the Texas & Pacific Railroad Co. under the act of Congress approved March 3, 1871, and acts supplementary thereto. [They are the lands in New Mexico, Arizona and California appertaining to the line west of El Paso, which was built upon by the Southern Pacific Railroad Co., the present claimants.] The report accompanying the bill being very long, it was ordered to be printed in the

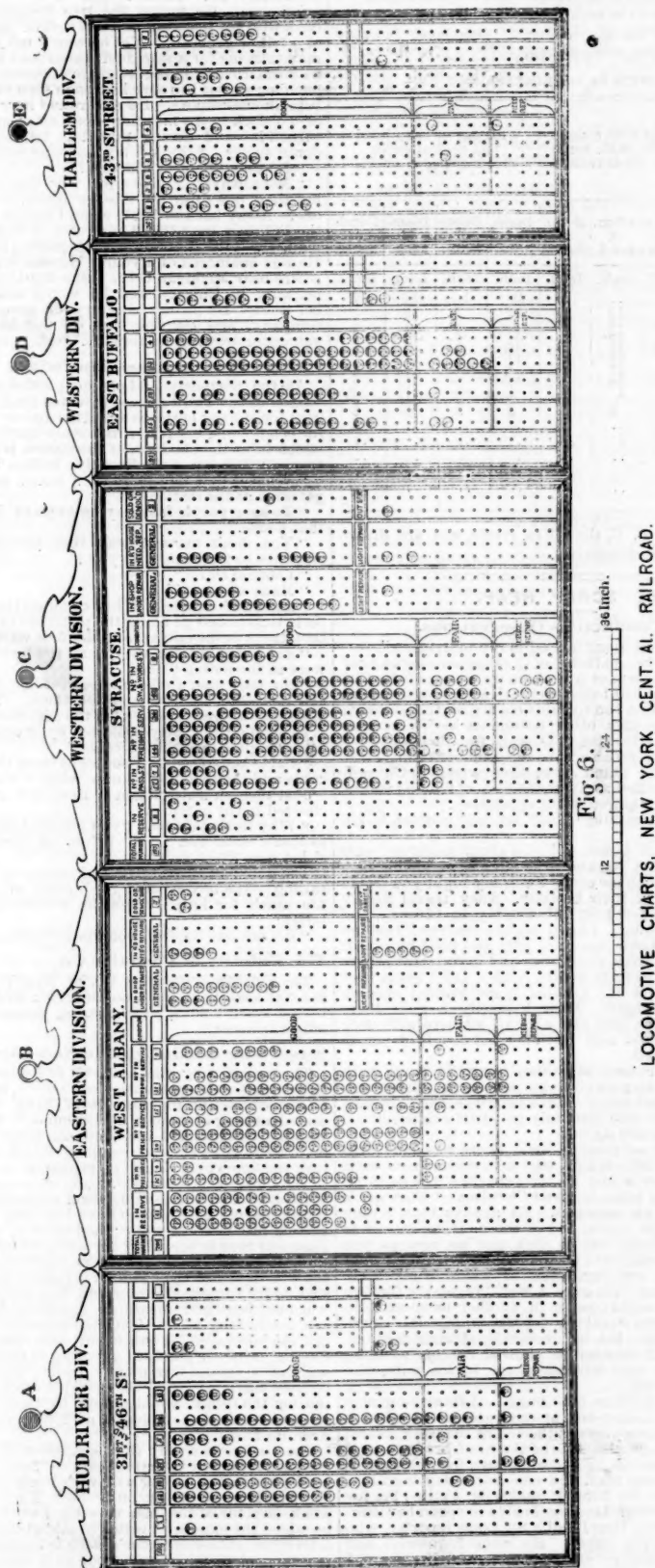


Fig. 6.

LOCOMOTIVE CHARTS, NEW YORK CENT. AL. RAILROAD.

self to the questions, but give any facts or exact data you may have bearing on the subject.

Please send replies not later than April 1, to H. Schlacks, Superintendent of Machinery, Illinois Central Railroad, Chicago, Ill.

H. SCHLACKS, }
J. M. BOON, } Committee.
H. MIDDLETON, }

Treatment of Mild Steel.

The following are the latest instructions issued by the British Admiralty on this subject:

All plates or bars to be bent cold where possible. Where plates or bars have to be heated the greatest care should be taken to prevent any work being done upon the material after it has fallen to the dangerous limit of temperature known as a "blue heat"—say from 600° to 400° F. Should this limit be reached during working the plates or bars should be reheated. Where plates or bars have been heated throughout for bending, flanging, etc., and the work has been completed at one heat, subsequent annealing is unnecessary. Where simple forge-work has been done, such as the formation of toggles, corners, and easy curves or bends, on portions of plates or bars, and the material has not been much distressed, subsequent annealing is unnecessary. Plates or bars which have had a large amount of work put upon them while hot, and have had to be reheated, should be subsequently annealed. It is preferred that this annealing should be done simultaneously over the whole of each plate or bar when this can be done conveniently. If it is inconvenient to perform the operation of annealing at one time for the whole of a plate or bar, portions may be annealed separately, proper care being taken to prevent an abrupt termination of the line of heat. If the severe working has been limited to a comparatively small part of a plate or bar, annealing may be limited to the parts which have been



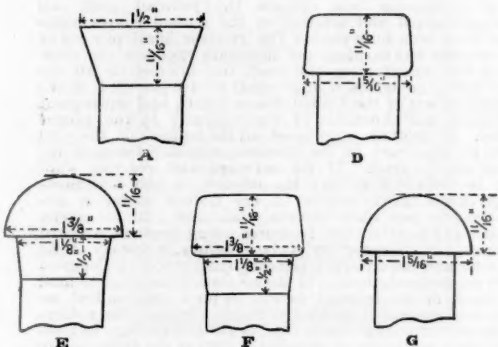
Fig. 1.



Fig. 2.



Fig. 3.



heated, the same care being taken to prevent an abrupt termination of the line of heat.

Any case of a bar or plate showing signs of failure or fracture in working must be reported to the Admiralty. Plates or bars need not be annealed after punching, except as regards butt straps in plates exposed to severe strains, which may be annealed or drilled after plating. Countersunk holes should be punched $\frac{1}{8}$ in. less in diameter than the rivets. Plates should be thoroughly cleaned of any scale before being painted. This is best done by immersion in dilute acid baths.

Tests for Plate, Beam, Angle, Bulb and Bar Steel.—Strips cut lengthwise or crosswise to have an ultimate tensile strength of not less than 58,000 lbs. and not exceeding 67,000 lbs. per square inch of section, with an elongation of 20 per cent. in 8 in. The beam, angle, bulb and bar steel to stand, hot and cold, forge tests sufficient to prove soundness of material. Strips cut crosswise or lengthwise $1\frac{1}{2}$ in. wide, heated uniformly to a low cherry-red and cooled in water of 82° F., must stand bending in a press to a curve of which the inner radius is $1\frac{1}{2}$ times the thickness of the steel tested. The strips are all to be cut in a planing machine, and to have the sharp edges taken off.

The ductility of every plate, beam, angle, etc., is to be ascertained by the application of one or both of these tests to the shearings, or by bending them cold by the hammer. All steel to be free from lamination and injurious surface defects. One plate, beam, angle, etc., to be taken for testing from every fifty. The pieces cut for testing to be parallel from end to end.

Plates will be ordered by weight per superficial foot; a latitude of 5 per cent. below this will be allowed in plates above $\frac{1}{2}$ in. thick, and 10 per cent. in thinner plates. In plates for boilers over 4 ft. wide and $\frac{1}{2}$ in. thick and upwards a latitude of $2\frac{1}{2}$ per cent. above and $2\frac{1}{2}$ per cent. below will be allowed, and 5 per cent. above and 5 per cent. below in thinner plates over 4 ft. wide.

Tests for Steel Rivets.—The rivets are to be made in strict accordance with the dimensions given in the schedule, and with the drawings, and to be supplied of any length demanded. Drawings of 1-in. rivets of the several descriptions specified in the schedule herewith.

The rivets are to be made from steel bars having an ultimate tensile strength of not less than 58,000 lbs. and not more than 67,000 lbs. per square inch, with a minimum

elongation of 20 per cent. in a length of 8 in. A portion of one bar to be taken for testing from every 50, before making into rivets. Pieces cut from every bar, heated uniformly to a low cherry-red, and cooled in water of 82° F., must stand bending in a press to a curve of which the inner radius is equal to the diameter of the bar tested. Rivets to be properly heated in making, and the finished rivets allowed to cool gradually. The rivets are to stand the following forge tests: (a) Bending cold without fracture, in the manner shown in fig. 1 in the annexed diagram, where the line AB equals one diameter of the rivet; (b) bending hot without fracture, in the manner shown in fig. 2; (c) flattening of the rivet-head while hot, in the manner shown in fig. 3 without cracking at the edges—the head to be flattened until its diameter is $2\frac{1}{2}$ times the diameter of the shank; (d) the shank of the rivet is to be nicked on one side, and bent over to show the quality of the material. One rivet in every hundred to be forged tested as a sample.

SCHEDULE OF DIMENSIONS.

Diameter of rivet.	With pan or snap head and straight neck to drawing D or G.		With countersunk heads to drawing A.		With pan or snap heads and conical necks to drawing E or F.			
	Diam. of head.	Depth of head.	Diam. of head.	Depth of head.	Diam. of head.	Depth of head.	Diam. of neck.	Depth of neck.
1 in.	1 1/8	1	1 1/8	1	1 1/8	1	1 1/8	1
1 1/4 in.	1 7/8	1 1/4	1 7/8	1 1/4	1 7/8	1 1/4	1 7/8	1 1/4
1 1/2 in.	2 1/8	1 1/2	2 1/8	1 1/2	2 1/8	1 1/2	2 1/8	1 1/2
1 3/4 in.	2 3/8	1 3/4	2 3/8	1 3/4	2 3/8	1 3/4	2 3/8	1 3/4
2 in.	2 7/8	2	2 7/8	2	2 7/8	2	2 7/8	2
2 1/4 in.	3 1/8	2 1/4	3 1/8	2 1/4	3 1/8	2 1/4	3 1/8	2 1/4
2 1/2 in.	3 3/8	2 1/2	3 3/8	2 1/2	3 3/8	2 1/2	3 3/8	2 1/2
2 3/4 in.	3 7/8	2 3/4	3 7/8	2 3/4	3 7/8	2 3/4	3 7/8	2 3/4
3 in.	4 1/8	3	4 1/8	3	4 1/8	3	4 1/8	3
3 1/4 in.	4 3/8	3 1/4	4 3/8	3 1/4	4 3/8	3 1/4	4 3/8	3 1/4
3 1/2 in.	4 7/8	3 1/2	4 7/8	3 1/2	4 7/8	3 1/2	4 7/8	3 1/2
3 3/4 in.	5 1/8	3 3/4	5 1/8	3 3/4	5 1/8	3 3/4	5 1/8	3 3/4
4 in.	5 3/8	4	5 3/8	4	5 3/8	4	5 3/8	4
4 1/4 in.	5 7/8	4 1/4	5 7/8	4 1/4	5 7/8	4 1/4	5 7/8	4 1/4
4 1/2 in.	6 1/8	4 1/2	6 1/8	4 1/2	6 1/8	4 1/2	6 1/8	4 1/2
4 3/4 in.	6 3/8	4 3/4	6 3/8	4 3/4	6 3/8	4 3/4	6 3/8	4 3/4
5 in.	6 7/8	5	6 7/8	5	6 7/8	5	6 7/8	5
5 1/4 in.	7 1/8	5 1/4	7 1/8	5 1/4	7 1/8	5 1/4	7 1/8	5 1/4
5 1/2 in.	7 3/8	5 1/2	7 3/8	5 1/2	7 3/8	5 1/2	7 3/8	5 1/2
5 3/4 in.	7 7/8	5 3/4	7 7/8	5 3/4	7 7/8	5 3/4	7 7/8	5 3/4
6 in.	8 1/8	6	8 1/8	6	8 1/8	6	8 1/8	6
6 1/4 in.	8 3/8	6 1/4	8 3/8	6 1/4	8 3/8	6 1/4	8 3/8	6 1/4
6 1/2 in.	8 7/8	6 1/2	8 7/8	6 1/2	8 7/8	6 1/2	8 7/8	6 1/2
6 3/4 in.	9 1/8	6 3/4	9 1/8	6 3/4	9 1/8	6 3/4	9 1/8	6 3/4
7 in.	9 3/8	7	9 3/8	7	9 3/8	7	9 3/8	7
7 1/4 in.	9 7/8	7 1/4	9 7/8	7 1/4	9 7/8	7 1/4	9 7/8	7 1/4
7 1/2 in.	10 1/8	7 1/2	10 1/8	7 1/2	10 1/8	7 1/2	10 1/8	7 1/2
7 3/4 in.	10 3/8	7 3/4	10 3/8	7 3/4	10 3/8	7 3/4	10 3/8	7 3/4
8 in.	10 7/8	8	10 7/8	8	10 7/8	8	10 7/8	8
8 1/4 in.	11 1/8	8 1/4	11 1/8	8 1/4	11 1/8	8 1/4	11 1/8	8 1/4
8 1/2 in.	11 3/8	8 1/2	11 3/8	8 1/2	11 3/8	8 1/2	11 3/8	8 1/2
8 3/4 in.	11 7/8	8 3/4	11 7/8	8 3/4	11 7/8	8 3/4	11 7/8	8 3/4
9 in.	12 1/8	9	12 1/8	9	12 1/8	9	12 1/8	9
9 1/4 in.	12 3/8	9 1/4	12 3/8	9 1/4	12 3/8	9 1/4	12 3/8	9 1/4
9 1/2 in.	12 7/8	9 1/2	12 7/8	9 1/2	12 7/8	9 1/2	12 7/8	9 1/2
9 3/4 in.	13 1/8	9 3/4	13 1/8	9 3/4	13 1/8	9 3/4	13 1/8	9 3/4
10 in.	13 3/8	10	13 3/8	10	13 3/8	10	13 3/8	10
10 1/4 in.	13 7/8	10 1/4	13 7/8	10 1/4	13 7/8	10 1/4	13 7/8	10 1/4
10 1/2 in.	14 1/8	10 1/2	14 1/8	10 1/2	14 1/8	10 1/2	14 1/8	10 1/2
10 3/4 in.	14 3/8	10 3/4	14 3/8	10 3/4	14 3/8	10 3/4	14 3/8	10 3/4
11 in.	14 7/8	11	14 7/8	11	14 7/8	11	14 7/8	11
11 1/4 in.	15 1/8	11 1/4	15 1/8	11 1/4	15 1/8	11 1/4	15 1/8	11 1/4
11 1/2 in.	15 3/8	11 1/2	15 3/8	11 1/2	15 3/8	11 1/2	15 3/8	11 1/2
11 3/4 in.	15 7/8	11 3/4	15 7/8	11 3/4	15 7/8	11 3/4	15 7/8	11 3/4
12 in.	16 1/8	12	16 1/8	12	16 1/8	12	16 1/8	12
12 1/4 in.	16 3/8	12 1/4	16 3/8	12 1/4	16 3/8	12 1/4	16 3/8	12 1/4
12 1/2 in.	16 7/8	12 1/2	16 7/8	12 1/2	16 7/8	12 1/2	16 7/8	12 1/2
12 3/4 in.	17 1/8	12 3/4	17 1/8	12 3/4	17 1/8	12 3/4	17 1/8	12 3/4
13 in.	17 3/8	13	17 3/8	13	17 3/8	13	17 3/8	13
13 1/4 in.	17 7/8	13 1/4	17 7/8	13 1/4	17 7/8	13 1/4	17 7/8	13 1/4
13 1/2 in.	18 1/8	13 1/2	18 1/8	13 1/2	18 1/8	13 1/2	18 1/8	13 1/2
13 3/4 in.	18 3/8	13 3/4	18 3/8	13 3/4	18 3/8	13 3/4	18 3/8	13 3/4
14 in.	18 7/8	14	18 7/8	14	18 7/8	14	18 7/8	14
14 1/4 in.	19 1/8	14 1/4	19 1/8	14 1/4	19 1/8	14 1/4	19 1/8	14 1/4
14 1/2 in.	19 3/8	14 1/2	19 3/8	14 1/2	19 3/8	14 1/2	19 3/8	14 1/2
14 3/4 in.	19 7/8	14 3/4	19 7/8	14 3/4	19 7/8	14 3/4	19 7/8	14 3/4
15 in.	20 1/8	15	20 1/8	15	20 1/8	15	20 1/8	15
15 1/4 in.	20 3/8	15 1/4	20 3/8	15 1/4	20 3/8	15 1/4	20 3/8	15 1/4
15 1/2 in.	20 7/8	15 1/2	20 7/8	15 1/2	20 7/8	15 1/2	20 7/8	15 1/2
15 3/4 in.	21 1/8	15 3/4	21 1/8	15 3/4	21 1/8	15 3/4	21 1/8	15 3/4
16 in.	21 3/8	16	21 3/8	16	21 3/8	16	21 3/8	16
16 1/4 in.	21 7/8	16 1/4	21 7/8	16 1/4	21 7/8	16 1/4	21 7/8	16 1/4
16 1/2 in.	22 1/8	16 1/2	22 1/8	16 1/2	22 1/8	16 1/2	22 1/8	16 1/2
16 3/4 in.	22 3/8	16 3/4	22 3/8	16 3/4	22 3/8	16 3/4	22 3/8	16 3/4
17 in.	22 7/8	17	22 7/8	17	22 7/8	17	22 7/8	17
17 1/4 in.	23 1/8	17 1/4	23 1/8	17 1/4	23 1/8	17 1/4	23 1/8	17 1/4
17 1/2 in.	23 3/8	17 1/2	23 3/8	17 1/2	23 3/8	17 1/2	23 3/8	17 1/2
17 3/4 in.	23 7/8	17 3/4	23 7/8	17 3/4	23 7/8	17 3/4	23 7/8	17 3/4
18 in.	24 1/8	18	24 1/8	18	24 1/8	18	24 1/8	18
18 1/4 in.	24 3/8	18 1/4	24 3/8	18 1/4	24 3/8	18 1/4	24 3/8	18 1/4
18 1/2 in.	24 7/8	18 1/2	24 7/8	18 1/2	24 7/8	18 1/2	24 7/8	18 1/2
18 3/4 in.	25 1/8	18 3/4	25 1/8	18 3/4	25 1/8	18 3/4	25 1/8	18 3/4
19 in.	25 3/8	19	25 3/8	19	25 3/8	19	25 3/8	19
19 1/4 in.	25 7/8	19 1/4	25 7/8	19 1/4	25 7/8	19 1/4	25 7/8	19 1/4
19 1/2 in.	26 1/8	19 1/2	26 1/8	19 1/2	26 1/8	19 1/2	26 1/8	19 1/2
19 3/4 in.	26 3/8	19 3/4	26 3/8	19 3/4	26 3/8	19 3/4	26 3/8	19 3/4
20 in.	26 7/8	20	26 7/8	20	26 7/8	20	26 7/8	20
20 1/4 in.	27 1/8	20 1/4	27 1/8	20 1/4	27 1/8	20 1/4	27 1/8	20 1/4
20 1/2 in.	27 3/8	20 1/2	27 3/8	20 1/2	27 3/8	20 1/2	27 3/8	20 1/2
20 3/4 in.	27 7/8	20 3/4	27 7/8	20 3/4	27 7/8	20 3/4	27 7/8	20 3/4
21 in.	28 1/8	21	28 1/8	21	28 1/8	21	28 1/8	21
21 1/4 in.	28 3/8	21 1/4	28 3/8	21 1/4	28 3/8	21 1/4	28 3/8	21 1/4
21 1/2 in.	28 7/8	21 1/2	28 7/8	21 1/2	28 7/8	21 1/2	28 7/8	21 1/2
21 3/4 in.	29 1/8	21 3/4	29 1/8	21 3/4	29 1/8	21 3/4	29 1/8	21 3/4
22 in.	29 3/8	22	29 3/8	22	29 3/8	22	29 3/8	22
22 1/4 in.	29 7/8	22 1/4	29 7/8	22 1/4	29 7/8	22 1/4	29 7/8	22 1/4
22 1/2 in.	30 1/8	22 1/2	30 1/8	22 1/2	30 1/8	22 1/2	30 1/8	22 1/2
22 3/4 in.	30 3/8	22 3/4	30 3/8	22 3/4	30 3/8	22 3/4	30 3/8	22 3/4
23 in.	30 7/8	23	30 7/8	23	30 7/8	23	30 7/8	23
23 1/4 in.	31 1/8	23 1/4	31 1/8	23 1/4	31 1/8	23 1/4	31 1/8	23 1/4
23 1/2 in.	31 3/8	23 1/2	31 3/8	23 1/2	31 3/8	23 1/2	31 3/8	23 1/2
23 3/4 in.	31 7/8	23 3/4	31 7/8	23 3/4	31 7/8	23 3/4	31 7/8	23 3/4
24 in.	32 1/8	24	32 1/8	24	32 1/8	24	32 1/8	24
24 1/4 in.	32 3/8	24 1/4	32 3/8	24 1/4	32 3/8	24 1/4	32 3/8	24 1/4
24 1/2 in.	32 7/8	24 1/2	32 7/8	24 1/2	32 7/8	24 1/2	32 7/8	24 1/2
24 3/4 in.	33 1/8	24 3/4	33 1/8	24 3/4	33 1/8	24 3/4	33 1/8	24 3/4
25 in.	33 3/8	25	33 3/8	25	33 3/8	25	33 3/8	25
25 1/4 in.	33 7/8	25 1/4	33 7/8	25 1/4	33 7/8	25 1/4	33 7/8	25 1/4
25 1/2 in.	34 1/8	25 1/2	34 1/8	25 1/2	34 1/8	25 1/2	34 1/8	25 1/2

"Yaas, Tennessee's a pow'ful good state. I'm ready to go thar."

"Perhaps you would like tickets to Arkansas?"

"Good enough! I'll take tickets to ole Arkansas. Anything to git outer hyar. This is the strangest place I ever seen—so many houses and so many folks. I'm afeard to stay hyar."

Further questioning developed the fact that the travelers were from the mountains of western North Carolina. The woman had heard that money was to be earned easily in the cities by washing clothes and scrubbing floors, and, selling her household goods, she had started with her fatherless boy out into the great and unknown world to seek her fortune. Her trip to Atlanta was her first ride on the railroad. After hearing the woman's story, Captain Bush kindly told her that she had no business to travel without a guardian; that her journey was a rash experiment likely to end disastrously, and that her best course would be to return home where she had friends and perhaps relations, who took an interest in her.

The inexperienced traveler readily took his advice, purchased return tickets to her mountain home, and with her boy departed on the next train evidently in better spirits than when she first landed here.—*Atlanta (Ga.) Constitution.*

What Stopped It.

One day last fall a number of Virginians got together at Wheeling and organized a railroad company with a capital of \$30,000,000. Directors and officers were elected, prospectus written, a memorial asking for a charter drawn up, and the meeting adjourned for one week. Two or three days later the President met one of the most enthusiastic of his co-laborers and said:

"Our whole project is dished!"

"No!"

"Sure's you live!"

"How's that?"

"Why, yesterday I got a horse and rode over the first five miles of the proposed line. I discovered that we should need ten cattle guards, six culverts and a \$500 bridge in that distance, making an outlay of at least \$1,000, and we might as well lay down our cards."

"Why, colonel?"

"Why? Because the whole idiotic gang of us will be dead-broke by the time we pay for the printing of that prospectus and give a reporter \$5 for booming the project."

"That's so—that's so," mused the other. "Why, colonel, I never had the remotest idea that we should want to use a dollar except to buy French mirrors for the President's office."—*Wall Street News.*

TECHNICAL.

Locomotive Building.

The Rogers Locomotive Works in Paterson, N. J., last week discharged some additional men, bringing down the total force employed to about one-fourth of the full number. It is said that one reason for this large reduction is the purpose of the management to reorganize the works entirely.

The Illinois Central shops at Water Valley and McComb City, Miss., on the Southern Division, besides doing the repair work of the division last year built several new engines for the road and two narrow-gauge engines for the Natchez, Jackson & Columbus road.

Car Notes.

The North Carolina Car Co. in Raleigh, N. C., is building a lot of flat cars for the Raleigh & Gaston road. It recently completed a lot of narrow-gauge box cars intended to carry 18 tons each.

The Wagon Car & Foundry Co. in Chattanooga, Tenn., is building a large number of freight cars for the Alabama Great Southern road.

The Fitchburg Railroad shops in Charlestown, Mass., have just completed three new passenger cars, built especially for use on suburban trains.

The Pullman shops at Pullman, Ill., are building a number of sleeping cars for use on the Mexican Central Railroad.

Bridge Notes.

The Central Bridge Co. in Buffalo has taken a contract to replace the wooden towers now supporting the foot bridge at Niagara Falls with iron towers. The work will be done in the spring.

The Delaware Bridge Co., of New York, built the great iron viaduct over Stony Brook Glen, on the new Lackawanna & Pittsburgh road, which is 700 ft. long and 237 ft. high from the bed of the stream.

Iron Notes.

The Washburn Iron Co. of Worcester, Mass., has made a contract for the erection of a Bessemer steel plant with two converters at its mill in Worcester. This company has hitherto rolled steel rails from imported or purchased blooms, but will hereafter make its own steel.

The Cleveland Rolling Mill Co. in Cleveland, O., is now running all the departments of its mills full time. The company has lately taken orders for 25,000 steel rails.

The Hartman Steel Works in Beaver Falls, Pa., are running single turn in all the departments. The new bar mill is nearly finished.

The Old Virginia Nail & Iron Works in Lynchburg, Va., have started up making bar iron and nails. They are also making all the light iron rails for a narrow gauge road, at Indian Rock, near Lynchburg.

The American Sheet Iron Co. at Phillipsburg, N. J., has started up its mill after a stoppage of ten weeks.

The Thomas Iron Co. at Hokendauqua, Pa., has blown in its fourth furnace, and the fifth will soon be put into blast.

The Penn Iron Works in Lancaster, Pa., has started up in all the departments, except the puddling mill, which is stopped on account of a strike against a reduction of wages.

The Miller Forge Co. (Pittsburgh) says: "The Miller Forge Co., at its new works at Rankin Station, Baltimore & Ohio Railroad, is just completing a large contract for the heaviest forgings ever made in this part of the country. The work is for a large shipbuilding firm in the East, and comprises the entire forging for a large steamship. Some idea can be formed of the work when we state that the cranks when finished weighed over 7 tons each, and were 42 in. across the head. The crank pins were made of steel, and when finished are 18 in. diameter, 4½ ft. long. The shafts weigh over 9 tons each, having 3 collars forged on each end 33 in. in diameter."

Manufacturing Notes.

Mr. S. A. Welch has formed a business connection with Mr. Henry R. Worthington, manufacturer of pumps and hydraulic machinery. Mr. Welch will hereafter have charge of the interests of the Worthington meter.

The Westinghouse Machine Co., in Pittsburgh, is building two Westinghouse engines for the new shops of the Chesapeake, Ohio & Southwestern road. The car shops will have an engine of 100 horse-power, and the machine shop one of 65 horse-power.

The Legrande electric signals are being tested at Crescent

Hill, Ky., on the Short Line Division of the Louisville & Nashville road. There are three blocks of the signal in operation, each taking in about one mile, and these are operated in the usual manner of block signals. When the train enters on the first block the signal is thrown to danger, and remains at that point until the train has passed off the section covered by that signal, and so on, over the whole distance covered by the three signals. It is claimed for this signal that ground contact has no effect upon the working of the wires, and also that a misplaced switch or a car left upon a siding in such a manner that it does not clear the main track will throw the signal to danger.

The Standard Iron Works in Minneapolis, Minn., have been awarded a contract for two additional large pumps for the water supply of the city. The new pumps will have a capacity of about 10,000,000 gallons a day. The large pumps already in use were built in the same shops.

The Rail Market.

Steel Rails.—The market is quiet and steady, with quotations at \$34 to \$35 per ton at mill, and little present disposition to scale prices. Sales of 30,000 tons are reported, chiefly for Southern roads. A small order for rails to go to Cuba has been taken.

Rail Fastenings.—Spikes continue steady at \$2.50 per 100 lbs. in Pittsburgh, and track-bolts at \$2.70 to \$3. Splice-bars are quoted at 1.75 to 1.80 cents per pound, with better demand.

Old Rails.—The market is irregular, with a tendency to better prices. Sales of small lots of iron rails are reported at \$22.75 to \$23.50 per ton for tees at tidewater.

The Loughridge Brake Suit.

In the United States Court, in Pittsburgh, Feb. 4, suit was begun by Wm. Loughridge, of Baltimore, against the Westinghouse Air-Brake Co., to restrain the latter from what Mr. Loughridge claims are infringements on a number of patents held by him. Similar suits have been begun before, but none of them have as yet been brought to trial.

Heating Freight Cars.

The Eastman Freight Car Heater Co. is now running a line between New York and Boston, chiefly for carrying imported fruits, and expects soon to start a line between New York and Chicago. The company has for some time had three hundred cars on the Eastern & West Central and the New Brunswick railroads, chiefly employed in carrying potatoes from Maine and New Brunswick to Boston.

A Long Tunnel.

The tunnel contract on the Washington aqueduct is being pushed by Beckwith & Quackenbush, of New York, the contractors. This tunnel is a little over four miles in length. The contractors use Ingersoll rock drills entirely.

A Station Indicator for Cars.

An automatic station indicator invented by Mr. H. E. Bissell, of Hartford, Conn., is now being tried on the elevated railroads in New York. One of these indicators is in operation on the cars in use on the branch road running to the 34th street ferry, and has so far worked very well. At either end of the car just above the door is a neat box on which is painted the words "Next Station." Below this appears the name of the station at which the next stop is to be made by the train. For example, take a train on the Third Avenue line: A passenger entering the train at Ninth street will see at each end of the car "Next Station—9th St." But as soon as the train left that station he would hear a bell ring at either end of the car and would see the annunciator change to read "Next Station—14th St." The same changes would be made at 18th, 23d and 28th, and so on up. At 34th street station the annunciator would read: "Change cars for 34th street ferry," and at 42d street, "Change cars for Grand Central Depot." All these changes are made automatically and at the same time in every car on the train. The machinery is very simple and the ringing of the bells and changing of the indicator are accomplished by the moving of a small lever in the locomotive cab which is connected with the air brake valves. The connection between the cars and the locomotive are simple rubber tubes similar to air-brake hose, but smaller in size. It will probably be applied on all the cars on the elevated roads.

Lighting Trains With Electricity.

An interesting experiment is now being carried out on a suburban train on the Metropolitan District Railway (England), the cars being lit by electricity direct. A Siemens dynamo and a Willans three-cylinder engine are placed in the baggage car. Steam is supplied to the engine by means of a small boiler, which is also fixed in the car. The cars are lit by 28 Swan incandescent lamps of 20-candle power each, which give a very brilliant light. The present machinery was designed for a longer train, and, in addition to the lamps in the passenger cars, there are about 30 in the baggage car which are always lighted when the others are. The object of this is to ascertain the exact cost of working a sufficient number of lights for the longer trains, which are usually fitted with 50 lamps, burning either ordinary or Pintsch's gas. The results of the first public trial were considered very satisfactory, and it is therefore intended to continue the experiment for some weeks, the train being all the time in regular work. Should the machinery prove effective and trustworthy the Willans engine and a dynamo will be placed on the engine of the train so that steam can be supplied from the locomotive boiler. This arrangement will necessarily prove cheaper, inasmuch as the small boiler and the special attendant in the baggage car will not be required. It is anticipated that the cost of lighting a train by electricity direct will be much less than that of oil lamps.

To Prevent a Frozen Pipe Bursting.

Mr. George B. Foote writes to the *American Machinist*: "In a ½ in. pipe use a piece of ½ in. rubber tube, stiffened by a piece of stove-pipe wire run through it. The rubber tube should be as long as that portion of the water pipe which is liable to freeze. With a strong thread tie each end of the rubber tube tight around the stiffening wire, and run it into the water pipe. When the water freezes it will compress the air in the rubber tube instead of splitting the pipe. Water pitchers and other vessels containing water can be protected from bursting by using a coil of rubber tubing inside of them. The tube should be so arranged that a part of it will come in the centre of the vessel."

Relative Dead Weight of Rolling Stock.

As the very important question of railway rates for goods traffic is intimately connected with the carrying capacity and proportion of dead weight to paying load of the vehicles used, it is interesting to investigate the construction and proportions of a typical American car, and discover, if possible, whether it possesses any advantages as compared with the widely different style of rolling stock used on this side the Atlantic.

We therefore believe that a description of a fine box car built for the New York, West Shore & Buffalo Railway

from the designs of the late Mr. Howard Fry will prove interesting to our readers.

The car is somewhat more strongly and heavily designed than is usual, the tare being 24,900 lbs., or slightly less than half the capacity, or maximum paying load. The subjoined table shows the relative capacity, tare, etc., of this car as compared with representative English covered and open wagons:

	Two English covered wagons.	N. Y. W. S. & B. R. car.	Two English open wagons.
Stowage length, over buffers.....	38 ft. 6 in.	35 ft. 11½ in.	38 ft. 3 in.
Height, rail to top of roof.....	10 ft. 11 in.	11 ft. 1½ in.	—
Width over all.....	8 ft. 6½ in.	9 ft. 4½ in.	8 ft. 5 in.
Tare.....	23,200 lbs.	24,900 lbs.	24,200 lbs.
Area floor.....	223 sq. ft.	202 sq. ft.	208 sq. ft.
Do. per foot stowage length.....	5.70 lb.	7.59 lb.	6.74 lb.
Weight per square foot floor area.....	131.1 lb. sq. ft.	95 lb. sq. ft.	116.3 lb. sq. ft.
Capacity to level of top of door opening.....	1311 cu. ft.	1000 cu. ft.	409 cu. ft.
Capacity per foot stowage length.....	34.5 cu. ft.	44.7 cu. ft.	—
Weight per foot cubic capacity.....	22.3 lb. cu. ft.	15.5 lb. cu. ft.	—

The table shows that the American car weighs less and holds more than two English covered wagons, while it occupies less length in a train. It is, however, wider than most English loading gauges permit, though without the brake wheel it might pass through the Metropolitan tunnels with an inch or two to spare. It appears that, while an English covered wagon requires 22.3 lbs. weight of vehicle for each cubic foot of capacity, the same result is achieved in the American car by 15.5 lbs. weight of vehicle, a very marked difference, which deserves more notice than it has hitherto received. In other words, one ton's weight of vehicle gives 100 cubic feet capacity in the short wagon, and 144 cubic feet capacity in the longer car. It is, of course, unfair to make a similar comparison between covered and open vehicles; but taking the floor space as a basis it appears again that the American car has less dead weight than an open wagon. One square foot of floor is secured by 95 lbs. of vehicle in one case, and by 116 lbs. in the other. The weight of the tarpaulins are included in the weight of the open wagons in order to make a fair comparison. A train of 24 American cars would be shorter and have less dead weight than a train of 50 English open wagons, but would have 21 per cent. more floor area.

There is very little expensive wrought-iron work in any part of the car, and the heavy knees, spider plates, hinges, etc., usual in English wagons, are conspicuous by their absence. This is partly due to the better quality of American castings, which can be freely used under trying strains which would fracture our weaker material. It is characteristic of the difference in the nature of the traffic of the two countries that while an English wagon is provided in every direction with knees and diagonals to resist distortion from the shocks of shunting, the American car is thoroughly trussed to resist the strains produced by its heavy paying load. We think our readers will agree with us in considering this car to be remarkably well and strongly designed, while its small weight in proportion to the load carried, compares very favorably with the results obtained on this side of the Atlantic. Some reduction of the dead weight and stowage length as compared with the cubic capacity of our goods traffic rolling-stock is much needed. The car we now illustrate shows one method of effecting this reduction. Another may be found in an iron coal wagon, weighing 5 tons and measuring 14 ft. over buffers, designed by Mr. J. A. F. Aspinall, to supersede a wooden wagon weighing 6 tons 8 cwt., and measuring no less than 21 ft. 4 in. over buffers, both wagons carrying the same weight of coal.—*The Engineer.*

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette*:

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South Carolina.

This company owns a line from Charleston, S. C., to Augusta, Ga., 137 miles, with branches from Branchville, S. C., to Columbia, 68 miles; Kingville to Camden, 38 miles, and Ten-mile to Phosphate Mine, 3 miles, making 248 miles in all. The Ten-mile Branch was completed about the end of 1882. The report just issued is for the year ending Dec. 31.

The general account, condensed, is as follows:

Stock.....	\$4,204,160.00
Old first-mortgage bonds.....	902,497.32
Bonds due and payable on demand.....	184,830.59
First consolidated mortgage.....	4,015,000.00
Second ".....	980,000.00
Income mortgage bonds.....	2,538,000.00
Interest accrued.....	212,570.66
Bills and accounts.....	202,210.44
Profit and loss.....	15,571.80
Total.....	\$13,404,870.81
Road and property.....	\$12,849,680.83
N. Y. & Charleston Warehouse & Steam Navigation Co.....	187,546.00
Barnwell R. R.....	70,616.17
Materials.....	125,000.45
Accounts and balances.....	117,423.50
Cash.....	62,097.77
Total.....	13,404,870.81

The company has in the treasury \$350,000 second consolidated bonds and \$462,000 income bonds. It owns \$90,000 Barnwell Railroad bonds, valued in the accounts at 70.

The earnings for the year were as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Freight.....	\$982,977	\$982,155	1	\$822 0.8
Passengers.....	302,420	296,105	1	6,315 2.1
Mail, etc.....	41,572	35,561	1	6,011 17.0
Total.....	\$1,326,969	\$1,313,821	1	\$13,148 1.0
Expenses.....	894,128	812,631	1	61,497 10.0
Net earnings.....	\$432,841	\$501,190	D.	\$68,349 13.6
Gross earn. per mile.....	5,394	5,407	D.	13 0.2
Net.....	1,790	2,063	D.	303 14.3
Per cent. of exps.....	67.38	61.85	I.	5.53

The net earnings of the New York & Charleston Ware-

house & Steam Navigation Co. for the year were \$11,538.46; those of the Barnwell Railroad were \$2,680.03. The profit and loss account is as follows:

Balance, Jan. 1, 1883.....	\$21,173.85
Net earnings.....	432,874.91
Dividend, 6 per cent., on N. Y. & Charleston Warehouse & Steam Nav. Co. stock.....	11,190.00
Interest paid by Barnwell R.R.....	2,700.00
Total.....	\$407,938.76
Fixed charges, 1883.....	\$57,754.07
Interest, 3 per cent., on income bonds.....	78,140.10
Discount on bonds sold.....	892.90
Expense paying bonds matured.....	1,579.99
Balance.....	\$15,571.80

Expenditures for betterments and new property during the year were \$174,911.41, the chief items being for new equipment \$84,307.20, and for 2,500 tons new steel rails (less proceeds of old iron), \$74,715.70.

The report says: "The increased expense of maintaining the road is more than accounted for by the greater length of bridges and trestles rebuilt during the year. The increase of taxes is due to the fact that in this year, for the first time since it was built, the entire length of road has been assessed. Hitherto the Columbia and Camden branches, 106 miles in all, have been exempt. There has been no change in the valuation, which is \$14,000 per mile, and the taxes for 1884 will vary but slightly from 1883. The increase in expense of operating road is due to a large increase of tonnage and train mileage during the year, and the increase in car mileage paid is due to a similar increase of through business coming in foreign cars, and is partly offset by larger car mileage received.

"The reason why freight earnings show no corresponding increase is that the falling off in local cotton from the upper part of the state of South Carolina in the months of October, November and December caused a loss of revenue sufficient to overbalance the gain up to Oct. 1. The tonnage carried in these three months, notwithstanding the deficiency in cotton, was greater than in the corresponding months in 1883, and prevented any reduction in operating expenses even in these months. The heavy falling off in our cotton receipts from the territory referred to is due to the smallness of the crop in that section, and not to diversion of business.

"The earnings of the New York & Charleston Warehouse & Steam Navigation Co. for the year were made with only half the capacity that now exists, and will certainly be much exceeded in 1884."

New York, Ontario & Western.

This company owns a line from Middletown, N. Y., to Oswego, 249.6 miles, with branches to Ellenville, 8 miles; to Delhi, 16.7 miles; to New Berlin, 22.3 miles, and to Cortland 48 miles. It also owns and works, jointly with the New York, West Shore & Buffalo, an extension from Middletown, N. Y., to Weehawken, N. J., 77.5 miles, making a total of 422.1 miles worked. There are 52.9 miles of second track (all on the extension) and 89.74 miles of sidings. The report is for the year ending Sept. 30.

The equipment consists of 73 locomotives; 47 passenger, 8 combination and 20 baggage, mail and express cars; 452 box, 17 milk, 62 stock, 601 flat and 641 coal cars; 22 service cars.

The present company is a reorganization through foreclosure of the New York & Oswego Midland.

The general account is as follows:

Preferred stock.....	\$2,000,000
Common stock.....	58,113,981
Proceeds of N. Y. West Shore & B. bonds sold.....	4,882,068
Loans and bills payable.....	1,681,918
Pay rolls and accounts unpaid.....	621,089
Current accounts.....	27,922
Profit and loss.....	458,895
Total.....	\$67,776,845
Road and equipment.....	\$52,856,018
Other lines leased or owned.....	11,677,460
West Shore & Ontario Terminal Co.....	2,064,000
Floating equipment.....	154,803
Materials.....	637,092
Bills and accounts.....	34,025
Cash.....	44,584
Total.....	\$67,776,845

This company owned \$10,000,000 of the first mortgage bonds of the New York, West Shore & Buffalo Railway Co., \$9,759,000 of which were offered to the stockholders of this company at 50 per cent. of their par value and sold to them by subscription at that rate.

The traffic for the year was as follows:

Train miles:	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passenger.....	384,854	234,056	I.	150,198 64.0
Mixed.....	239,428	225,035	I.	13,493 5.9
Freight.....	364,289	283,401	I.	78,708 27.6
Service and switching.....	142,221	164,587	D.	22,366 13.5
Total.....	1,130,792	910,669	I.	220,123 24.2
Passengers carried.....	546,803	391,458	I.	55,345 14.2
Passenger-miles.....	15,701,001	8,392,845	I.	7,308,156 87.8
Tons freight moved.....	562,836	469,526	I.	93,310 19.9
Ton-miles.....	39,162,019	30,657,380	I.	8,474,639 27.7

The traffic is notable as being lighter than that of any other eastern road of considerable length. The increase in passenger-miles and in train mileage was chiefly due to the opening of the extension to Weehawken.

The earnings for the year were as follows:

Freight.....	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passengers.....	\$754,279	\$605,478	I.	\$148,801 24.6
Mails.....	354,777	211,789	I.	142,988 67.4
Other sources.....	17,590	36,017	D.	18,427 51.2
Total.....	\$1,357,778	\$1,036,765	I.	\$321,013 31.0
Expenses.....	1,198,076	848,504	I.	349,572 41.2
Net earnings.....	\$159,702	\$188,061	D.	\$28,359 15.1
Gross earn. per mile.....	3.689	3.008	I.	.681 22.0
Net.....	.432	.546	D.	.114 20.9
Per cent. of exps.....	88.24	81.86	I.	6.38

The large proportion of earnings reported under the head of miscellaneous is notable. The earnings continue very light.

No statement of the disposition of the net earnings is given. The expenditures for new construction and equipment during the year were \$645,895, and on other lines owned and leased (the line to Weehawken) they were \$3,773,525.

President Winslow's report says: "The difficulties referred to in the last report in the construction of the railway between Middletown and Weehawken were, after great and unexpected delays, successfully overcome, and the line opened for traffic June 4, 1883. The terminal facilities at Weehawken were not, however, in condition to be used for freight business until the middle of September, 1883, and

RAILROAD EARNINGS IN DECEMBER.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1883.	1882.	Inc.	Dec.	P. c.	1883.	1882.	Inc.	Dec.	P. c.	1883.	1882.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Boston, Hoosac Tun. & W.*	72	72				\$ 32,542	\$ 25,457	\$ 7,085	\$ 27.8		\$ 452	\$ 354	\$ 98	\$ 27.8	
Eastern.....	284	284				250,848	253,396	2,548	1.0		883	892	9	1.0	
Grand Trunk.....	2,313	2,321	8	0.3		1,335,784	1,480,202	144,418	9.8		578	638	60	9.3	
Long Island.....	354	354				153,348	156,980	3,632	2.3		433	443	10	2.3	
Northern Central.....	322	322				409,151	490,063	80,912	16.5		1,271	1,522	251	16.5	
Pennsylvania.....	2,070	1,980	90	4.5		3,840,579	4,157,238	316,659	7.7		1,855	2,100	245	11.6	
Philadelphia & Reading.....	1,560	1,000	560	56.0		2,207,642	1,795,371	502,271	28.0		1,473	1,795	322	17.9	
Rochester & Pitts.*	294	125	169	135.2		91,178	28,000	63,178	225.6		310	224	86	38.4	
Rome, Wat. & Ogdensburg*.	417	417				133,375	137,873	4,498	3.5		320	310	10	3.2	
West Jersey.....	188	177	11	6.2		75,465	72,931	2,534	3.5		401	412	11	2.7	
Total, 10 roads.....	7,874	7,052	822	11.7		8,619,912	8,591,454	28,458	0.3		1,095	1,218	123	10.1	
Total inc. or dec.....															

SOUTHERN ROADS.															
Ala. Gt. Southern.....	290	290				106,782	94,779	12,003	12.6		368	327	41	12.0	
Ches. & Ohio.....	517	517				324,527	253,355	71,172	28.1		628	490	138	28.1	
Eliz. Lex. & B. S.....	130	130				52,695	47,091	5,604	11.9		405	362	43	11.9	
Cin., N. O. & Tex. P.....	336	336				223,517	208,814	14,703	7.0		665	621	44	7.0	
East Tenn., Va. & Ga.....	1,098	901	197	21.9		374,945	341,342	33,603	9.8		342	378	36	9.5	
Fia. Central & Western.....	254	254				44,192	50,029	5,837	11.6		169	214	45	11.6	
Fia. Transit & Tex.....	243	243				64,654	51,664	12,990	24.8		266	214	52	24.8	
Ill. Central, Southern Div.....	578	578				510,000	603,796	93,796	15.4		883	1,044	161	15.4	
Louisville & Nash.....	2,065	2,023	42	2.1		1,232,800	1,221,509	11,291	0.9		597	602	5	0.8	
Mobile & Ohio.....	528	528				290,029	306,723	16,694	5.4		549	578	29	5.4	
Nash., Chatta. & St. L.....	554	539	15	2.8		209,999	210,675	676	0.3		379	391	12	3.1	
Norfolk & Western.....	503	428	75	17.5		232,752	224,758	7,994	3.4		463	525	62	12.0	
Rich. & Danville.....	757	757				334,640	322,448	12,192	3.8		442	426	16	3.8	
Char., Col. & Aug.....	343	327	16	4.9		77,913	80,851	2,938	3.6		227	247	20	8.1	
Col. & Greenville.....	296	296				65,570	97,537	31,967	32.6		221	336	115	32.6	
Virginia Midland.....	332	332				118,443	115,824	2,619	2.2		333	319	14	4.4	
Western N. C.....	200	190	10	5.3		33,784	26,044	6,740	25.3		169	142	27	19.3	
Shenandoah Valley.....	249	249				62,863	46,930	15,933	33.9		252	188	64	33.9	
Vicks. & Meridian.....	142	142				66,334	67,755	1,421	2.6		467	477	10	2.6	
Total, 19 roads.....	9,415	9,065	350	3.9		4,427,139	4,372,903	54,236	1.2		470	482	12	2.5	
Total inc. or dec.....															

CENTRAL GROUP.															
Chi. & Eastern Ill.....	252	252				141,289	140,458	831	0.6		561	557	4	0.6	
Chi. & Gr. Trunk.....	335	335				243,617	229,742	13,875	5.7		727	686	41	5.7	
Chi. & West Mich.....	410	390	20	5.1		164,118	125,477	38,641	23.5		405	322	83	21.2	
Cin., Ind., St. L. & Chi.....	342	342				186,579	190,564	3,985	2.1		546	557	11	2.1	
Cin., Wash. & Balt.....	254	254				142,609	174,024	31,415	18.0		502	613	111	18.0	
Cleve., Akron & Col.....	144	144				33,816	39,676	5,860	14.7		235	276	41	14.7	
Det., Lan. & No.....	226	226				106,702	121,510	14,808	12.1		472	538	66	12.1	
Ev. & Terre Haute.....	146	146				59,976	59,982	6	0.0		411	411		0.0	
Fort & Pere Marq.....	362	347	15	4.3		199,605	206,171	6,566	3.2		552	594	42	7.0	
Ill. Central, Ill. lines.....	928	919	9	0.9		519,900	572,704	52,804	9.2		560	623	63	10.1	
Ind., Bloom. & West.....	695	695				202,812	205,211	2,399	1.2		292	295	3	1.2	
Ohio Southern.....	138	138				33,980	39,156	5,176	13.3		246	284	38	13.3	
Poria, Dec. & Ev.....	254	254				61,958	49,102	12,856	20.2		244	181	63	26.2	
St. L., Alton & Terre Haute.....	195	195				126,463	124,621	1,842	1.5		649	639	10	1.5	
St. L. & Alton.....	121	121				72,195	75,355	3,160	4.4		597	623	26	4.2	
St. L. & Cairo.....	152	152				25,243	33,978	8,735	25.1		166	223	57	25.1	
St. L., Cin. & St. L.....	856	850	6	0.7		102,335	79,634	22,701	20.4		121	145	24	16.6	
Wabash, St. L. & P.....	3,520	3,520				1,518,286	1,331,952	186,334	14.0		431	378	53	14.0	
Total, 18 roads.....	9,360	9,010	350	3.9		3,882,603	3,799,377	83,226	2.2		415	422	7	1.7	
Total inc. or dec.....															

NORTHWESTERN ROADS.															
Bur. Cedar Rap. & No.....	714	690	24	3.5		261,206	246,061	15,145	6.2		366	357	9	2.5	
Central Iowa.....	401	290	111	38.3		118,237	162,229	43,992	37.2		295	392	97	33.0	
Chi. & Alton.....	850	850				782,104	701,064	81,040	10.4		861	825	36	4.4	
Chi., Mil. & St. Paul.....	4,670	4,520	150	3.2		2,151,000	1,964,707	186,293	8.6		461	434	27	6.3	
Chi. & Northwestern.....	3,800	3,475	325	9.3		1,806,600	1,826,929		20,329	1.1	475	525	50	9.3	
Chi., St. P., M. & O.....	1,280	1,147	133	11.5		444,000	304,946	79,054	21.7		347	318	29	9.4	
Green Bay, W. & St. P.....	220	220				36,127	37,978		1,851	4.9	164	173	9	4.4	
Ill. Central, Iowa lines.....	402	412				158,100	156,880	1,220	0.8		393	390	3	0.8	
Marquette, H. & Ont.....	97	97				21,137	19,561	1,576	7.3		95	85	10	11.0	
Mil., L. S. & West.....	360	306	54	17.0		79,465	76,885	2,580	3.7		221	250	29	13.1	
Total, 10 roads.....	12,800	11,967	803			5,867,966	5,496,940	333,206	22,180		454	458	4	4	
Total inc. or dec.....			803	6.7				331,026	5.7					4	0.1

RAILROAD EARNINGS, YEAR ENDING DECEMBER 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1883.	1882.	Inc.	Dec.	P. c.	1883.	1882.	Inc.	Dec.	P. c.	1883.	1882.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Eastern.....	284	284	.....	.....	.....	\$ 3,614,504	\$ 3,417,845	\$ 196,659	.....	5.8	\$ 12,727	\$ 12,035	\$ 692	.....	5.8
Grand Trunk.....	2,318	2,258	60	.....	2.6	17,742,309	16,899,427	842,882	.....	5.0	7,654	7,484	170	.....	2.1
Ches. & Ohio.....	517	483	34	.....	7.0	3,924,934	3,334,877	589,957	.....	17.7	7,592	6,905	687	.....	9.9
Eliz., Lex. & B. S.....	130	130	.....	.....	.....	714,268	529,319	184,949	.....	35.0	5,494	4,072	1,422	.....	35.0
Cin., N. O. & Tex. P.....	333	336	.....	.....	.....	2,587,264	2,567,135	20,129	.....	0.7	7,700	7,640	60	.....	0.7
East Tenn., Va. & Ga.....	1,080	901	179	.....	19.9	4,138,164	3,351,356	786,808	.....	23.5	3,832	3,720	112	.....	3.0
Fla. Cen. & West.....	234	234	.....	.....	.....	422,570	418,676	3,894	.....	3.3	1,849	1,789	60	.....	3.3
Fla. Transit & Pen.....	243	217	26	.....	11.8	535,220	428,774	106,446	.....	24.8	2,203	1,976	227	.....	11.5
Ill. Central, So. Div.....	578	578	.....	.....	.....	4,359,993	3,848,536	511,457	.....	13.2	7,543	6,658	885	.....	13.2
Louisville & Nash.....	2,054	2,028	26	.....	1.3	14,130,224	12,698,659	1,431,565	.....	11.5	6,879	6,247	632	.....	10.1
Mobile & Ohio.....	528	528	.....	.....	.....	2,264,900	2,185,167	79,733	.....	3.6	4,280	4,139	150	.....	3.6
Nash. Chat. & St. L.....	534	530	4	.....	0.8	2,328,893	2,162,857	166,036	.....	7.7	4,203	4,013	190	.....	4.8
Norfolk & Western.....	475	428	47	.....	10.9	2,812,777	2,420,740	392,037	.....	16.0	5,922	5,677	245	.....	4.3
Rich. & Danville.....	757	757	.....	.....	.....	3,845,152	3,663,432	181,720	.....	4.9	5,080	4,839	241	.....	4.9
Char., Col. & Aug.....	343	327	16	.....	4.9	828,356	758,575	69,780	.....	8.2	2,415	2,320	95	.....	4.1
Col. & Greenville.....	296	296	.....	.....	.....	737,920	799,156	.....	61,236	7.7	2,498	2,700	.....	212	7.7
Va. Midland.....	352	352	.....	.....	.....	1,678,755	1,497,173	181,579	.....	12.1	4,769	4,253	516	.....	12.1
Western N. C.....	192	179	13	.....	7.3	382,037	250,791	131,246	.....	32.5	1,995	1,401	594	.....	42.4
Shenandoah Valley.....	249	241	8	.....	3.3	853,919	459,937	393,982	.....	85.6	3,439	1,908	1,531	.....	80.6
Vicks. & Meridian.....	142	142	.....	.....	.....	529,501	482,240	47,261	.....	9.8	3,729	3,396	333	.....	9.8
Total 19 roads.....	9,350	8,986	364	.....	.....	48,844,021	42,693,237	6,150,784	61,236	.....	5,149	4,751	398	.....	12.8
Total inc. or dec.....	.....	.....	364	.....	4.1	.....	.....	6,150,784	.....	12.8	.....	.....	398	.....	8.4
CENTRAL GROUP.															
Chi. & Eastern Ill.....	252	252	.....	.....	.....	1,657,571	1,785,183	.....	127,612	7.1	6,578	7,084	.....	506	7.1
Chi. & Gt. Trunk.....	335	335	.....	.....	.....	2,945,338	2,274,268	671,070	.....	29.5	8,792	6,789	2,003	.....	29.5
Chi. & West Mich.....	410	375	35	.....	8.3	1,543,839	1,500,197	43,642	.....	2.9	3,774	4,001	.....	227	5.7
Cin., Ind., St. L. & Chi.....	342	342	.....	.....	.....	2,496,347	2,576,103	.....	79,756	3.1	7,299	7,532	.....	233	3.1
Cin., Wash. & Balt.....	284	284	.....	.....	.....	1,857,878	1,797,005	60,873	.....	3.4	6,542	6,327	215	.....	3.4
Cleve., Akron & Col.....	144	144	.....	.....	.....	523,862	505,937	17,925	.....	3.5	3,638	3,514	124	.....	3.5
Det., Lan. & No.....	226	226	.....	.....	.....	1,590,246	1,590,658	.....	412	.....	7,036	7,038	.....	2	.....
Ev. & Terre Haute.....	146	146	.....	.....	.....	723,804	850,230	.....	126,336	14.9	4,958	5,823	.....	865	14.9
Flint & Pere Marq.....	349	349	.....	.....	0.9	2,543,815	2,162,930	380,885	.....	17.6	7,289	6,251	1,038	.....	16.6
Ill. Central, Ill. lines.....	927	919	8	.....	0.8	6,712,489	6,659,781	.....	247,292	3.5	7,241	7,573	.....	332	4.3
Ind., Bloom. & West.....	695	625	70	.....	11.2	2,927,533	2,639,016	288,517	.....	10.9	4,212	4,222	.....	10	0.2
Lake S. & Mich. So.....	1,340	1,275	65	.....	5.1	18,550,000	18,225,639	324,361	.....	1.8	13,843	14,295	.....	452	3.2
Mich. Central.....	1,412	1,412	.....	.....	.....	14,000,000	12,457,901	1,542,099	.....	12.4	9,915	8,823	1,092	.....	12.4
Ohio Southern.....	138	134	4	.....	3.0	415,141	385,864	29,277	.....	7.6	3,008	2,880	128	.....	4.4
Peoria, Dec. & Ev.....	254	254	.....	.....	.....	720,882	760,529	.....	39,647	5.2	2,838	2,984	.....	156	5.2
Pitts. & Lake Erie.....	70	70	.....	.....	.....	1,422,764	1,265,748	157,016	.....	10.8	20,639	18,082	2,657	.....	10.8
St. L. Alton & T. H.....	195	195	.....	.....	.....	1,453,249	1,456,031	.....	2,791	0.2	7,453	7,467	.....	14	0.2
Main Line.....	121	121	.....	.....	.....	826,033	875,460	.....	49,427	5.6	6,827	7,235	.....	408	5.6
St. L. & Cairo.....	152	152	.....	.....	.....	385,630	379,441	6,189	.....	1.6	2,537	2,446	91	.....	1.6
Tol. Cin. & St. L.....	724	500	224	.....	44.8	1,160,631	859,556	301,075	.....	35.0	1,603	1,719	.....	116	6.8
Wabash, St. L. & P.....	3,520	3,383	137	.....	4.0	16,908,463	16,738,338	170,125	.....	1.0	4,804	4,948	.....	144	2.9
Total 21 roads.....	12,036	11,490	546	.....	.....	81,345,616	78,945,975	2,399,641	673,273	.....	6,759	6,792	.....	33	0.5
Total inc. or dec.....	.....	.....	546	.....	4.8	.....	.....	2,399,641	.....	4.2	.....	.....	.....	33	0.5
NORTHWESTERN ROADS.															
Bur., Ced. Rap. & No.....	714	632	82	.....	9.5	2,846,770	2,600,681	246,089	.....	1.6	3,987	4,296	.....	209	7.2
Central Iowa.....	363	360	3	.....	0.8	1,307,103	1,161,158	145,945	.....	12.2	3,601	4,018	.....	417	10.4
Chi. & Alton.....	850	850	.....	.....	.....	8,773,010	8,215,494	557,516	.....	6.8	10,321	9,945	376	.....	6.8
Chi., Mil. & St. P.....	4,559	4,296	263	.....	6.1	23,639,824	20,386,726	3,253,098	.....	16.1	5,190	4,740	444	.....	9.4
Chi. & N. W.....	3,656	3,303	353	.....	10.7	25,059,364	23,977,667	1,081,697	.....	4.5	6,854	7,259	.....	403	5.6
Chi., St. P., M. & O.....	1,239	1,040	199	.....	19.1	5,516,195	4,962,300	553,895	.....	11.2	4,452	4,771	.....	319	6.5
Green Bay, W. & St. P.....	220	220	.....	.....	.....	412,244	393,307	18,937	.....	4.8	1,874	1,788	86	.....	4.8
Ill. Cent., Iowa lines.....	402	402	.....	.....	.....	2,015,332	1,945,532	69,800	.....	3.6	5,013	4,839	174	.....	3.6
Marquette, H. & O.....	99	92	7	.....	7.6	913,179	1,193,987	280,808	.....	24.4	9,123	12,978	.....	3,855	29.7
Mil., L. S. & W.....	328	281	47	.....	14.8	1,023,473	809,833	213,640	.....	17.7	3,120	3,096	24	.....	3.6
Wisconsin Central.....	440	337	103	.....	30.6	1,453,992	1,015,536	438,456	.....	43.2	3,305	3,013	292	.....	9.7
Total 11 roads.....	12,870	11,763	1,107	.....	.....	72,970,486	66,926,201	6,044,285	290,808	.....	5,670	5,606	.....	20	1.1
Total inc. or dec.....	.....	.....	1,107	.....	9.4	.....	.....	6,044,285	.....	9.0	.....	.....	.....	20	0.4
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific.....	1,476	698	778	.....	111.1	5,275,534	2,536,345	2,739,189	.....	108.0	3,574	3,614	.....	60	1.6
Northern Pacific.....	1,922	1,194	728	.....	60.7	10,340,574	6,965,909	3,374,665	.....	48.1	5,375	5,834	.....	459	7.9
St. P. & Duluth.....	205	196	9	.....	4.6	1,325,015	1,109,841	215,174	.....	19.4	6,463	5,092	801	.....	14.2
St. P., Minn. & Man.....	1,327	972	355	.....	36.6	8,394,601	8,764,771	.....	370,170	4.2	6,346	9,017	.....	2,691	29.9
Total 4 roads.....	4,930	3,060	1,870	.....	61.1	25,325,724	19,376,956	6,318,928	370,170	.....	5,137	6,332	.....	1,125	18.0
Total inc. or dec.....	.....	.....	1,870	.....	61.1	.....	.....	5,948,768	.....	30.7	.....	.....	.....	1,125	18.0
SOUTHWESTERN ROADS.															
Hous., E. & W. T.....	125	92	33	.....	35.9	337,820	266,928	70,892	.....	26.5	2,703	2,901	.....	198	6.8
K. C., Ft. S. & Gulf.....	389	365	24	.....	6.6	2,011,969	1,753,943	258,026	.....	14.7	5,172	4,805	367	.....	7.7
Little R. R'k. & Ft. S.....	169	168	1	.....	0.6	555,761	539,129	16,632	.....	3.1	3,289	3,209	80	.....	2.5
Lt. R'k. & Ft. S. & T.....	173	161	12	.....	7.5	413,631	314,473	99,158	.....	31.5	2,391	1,953	438	.....	25.5
Mo. Pacific.....	1,901	1,646	255	.....	15.4	17,107,441	15,676,827	1,430,614	.....	9.1	8,999	9,524	.....	525	5.5
Central Branch.....	388	388	.....	.....	.....	1,512,040	996,495	515,545	.....	52.8	3,923	2,568	1,355	.....	52.8
Mo., Kan. & Tex.....	2,188	2,038	150	.....	7.3	11,658,904	10,138,469	1,520,435	.....	14.9	7,329	4,975	2,354	.....	7.3
St. L. & Pacific.....	1,487	1,329	158	.....	12.7	7,005,113	5,919,733	1,085,379	.....	18.3	4,711	4,485	226	.....	18.3
St. L. & San Fran.....	744	665	79	.....	11.9	3,904,772	3,582,810	321,962	.....	8.9	5,248	5,388	.....	140	2.2
Total 9 roads.....	7,564	6,843	721	.....	.....	44,517,539	39,								



Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Mr. D. H. Neale, Mechanical Engineer, Associate Institute of Civil Engineers, has become attached to the editorial staff of the Railroad Gazette, and is recommended to the attention of railroad officers and others of whom he may seek information.

THE ATCHISON TOPEKA & SANTA FE.

The Atchison, Topeka & Santa Fe statement for 1883, giving actual earnings and expenses for 11 months and estimates for December, includes the Southern Kansas Railway. With but little change in mileage there was a decrease of \$242,340 (1½ per cent.) in gross earnings, but the great decrease of \$1,710,958 (18 per cent.) in working expenses, so that in net earnings there was an increase of \$1,468,618 (21½ per cent.). We are assured that the method of keeping the accounts was the same in both years, but, in the absence of statistics of traffic and details of expenses, this only makes the vast decrease of expenses the more astonishing, the general course of expenses on other roads in 1883 having been to increase rather than decrease. The Southern Kansas was not included in the report for 1882, but a separate report for it (or its predecessor, the Kansas City, Lawrence & Southern Kansas) was made, so that the aggregate earnings and expenses of the two can be ascertained and compared. For the eleven months ending with November the Southern Kansas had made a gain of \$377,017 (31 per cent.) in gross earnings and of \$108,217 (33½ per cent.) in net, while the Atchison reported a decrease of \$303,135 (2½ per cent.) in gross earnings and an increase of \$1,366,985 (23½ per cent.) in net, so that on the latter there was a decrease of \$1,670,120 (22 per cent.) in working expenses. Thus the decrease of expenses was even greater on the Atchison proper than is indicated by the statement for the two roads—probably for the year something like \$1,950,000, which of itself is equal to \$3.42 per share of stock.

Altogether the statement reports a net revenue from the two systems amounting to \$8,347,574, while the charges for interest, sinking funds, etc., were \$3,187,075, leaving as the stockholders' income \$5,160,499, which is \$9.07 per share of stock. The dividend paid was \$6, and of the \$1,745,937 balance \$37,500 is charged to discount on bonds issued in January, 1883, \$200,000 to reduction in value of stores on hand, \$250,000 to fire insurance fund, \$500,000 to credit of renewal account. The interest on the bonds of the controlled Sonora Railroad (in Mexico) had to be advanced by the Atchison, which guarantees it, as the Sonora Railroad lacked \$80,000 of earning its working expenses. This advance of interest, amounting to \$310,240, becomes an asset of the Atchison company, however—that is, the Sonora company owes it the money, and will have to pay it if it ever has anything to pay with; but virtually this is a part of the Atchison property, as it is liable for its

bonds and owns its stock. If the road should become profitable hereafter it will only pay the Atchison as past-due interest what otherwise it would pay it as dividends.

The land grant of the company continues to be a source of very large income. In 1883 \$1,364,810 was collected on land sales, and 322,221 acres sold for \$1,155,638 (\$3.59 per acre). Of the land receipts \$283,934 went for expenses and land taxes, and of the balance of \$871,699, \$202,335 was paid for interest and \$669,364 for the principal of bonds secured by the lands.

The funded debt of the company was changed by the issue of \$1,500,000 of new bonds and the purchase and cancellation of \$890,500 of old ones, the net increase being \$609,500. There was no increase in the capital stock. Heretofore the capital of this company has been greatly increased yearly by large issues of shares and bonds. In 1882 the increase of stock was no less than \$9,772,800, and of funded debt \$4,731,500.

The statement, however, describes large expenditures on capital account, amounting to \$1,688,258 for improvement of old road—all, we are informed, in the nature of permanent improvements, such as the excess of cost of renewing bridges with iron instead of wood, new shops, the excess of cost of larger and better buildings over that of old ones renewed, and additions to tools and equipment. Further, about \$1,350,000 was expended on the construction of 140 miles of new road in Kansas and 45 miles in New Mexico which are not yet all completed, 95 miles of track having been laid on them at the close of 1883. A large part of the cost of these, the statement says, was realized by the conversion of surplus materials into money.

For some years this road has had a very large traffic in materials for the construction of other railroads, on which it had a very long haul. The Mexican Central laid about 200 miles of track south of El Paso in 1882, and 300 or 400 miles last year. Most of the material and supplies for it probably passed over the whole length of the Atchison, Topeka & Santa Fe from Kansas City to El Paso, 1,170 miles. The Atlantic & Pacific laid 78 miles of track west of Albuquerque in 1880, 233 miles in 1881, 128 miles in 1882, and 136 miles last year. The Atchison also has been the chief carrier of materials for the Denver & Rio Grande, which built 240 miles of road in 1880, 431 in 1881, 216 in 1882, and about 150 miles in 1883. Further, the Atchison itself has been a great builder of railroads, though it has not made any great additions by construction since 1881, unless we count the Sonora Railroad, which probably received its materials chiefly by sea. In 1880 it built 400 miles and in 1881 256 miles. It would appear from this that the Atchison road carried materials for about 1,000 miles of new railroad in 1881, 680 miles in 1882, and 680 to 780 miles in 1883.

The construction of the Atlantic & Pacific and the Denver & Rio Grande was virtually finished in the first half of 1883, there remain but a few miles of the Mexican Central to be built from this direction, and the Atchison itself has but 45 miles under way. A very material falling-off of the earnings on this account is to be expected, therefore; but the falling-off should have begun already, for the only large amount of construction in the last half of 1883 was by the Mexican Central, and when we speak above of the road's carrying materials for so many miles of road in each year we speak roughly, as the material is carried before the road is built, and sometimes so long before as to make a material difference in the business of the year. Actually we find that the decrease in gross earnings of the Atchison proper was as great in the first half as in the last half of the year, and that the decrease in working expenses was much larger in the first half of the year averaging \$193,259 per month then (26 per cent.), while in the following five months it averaged but \$100,158 (16 per cent.). It should be borne in mind that the decrease of gross earnings so far shown has been inconsiderable, and that the remarkable feature in last year's working is not this, but the tremendous decrease in expenses, which is not explained by anything in the statement now issued, which is not the annual report. The decrease is too great to have been the result of ordinary causes of general application, but it may be the result of different causes. Exceptionally large renewals and additions to rolling stock in previous years would have made the proper expenditure for maintenance last year below the average, and neglect of maintenance last year would cause the same result. A large falling off of traffic, provided there were a corresponding decrease in train mileage, might have decreased expenses materially, but would have been likely to decrease earnings still more, and this road's earnings have decreased but little. It is to be hoped that the annual report will give the details of the expenses so

that it may be known wherein the great earnings of 1883 were made.

This company, however, has heretofore shown great fluctuations in its working expenses. For five successive years they have been the following percentages of the gross earnings:

1879.	1880.	1881.	1882.	1883.*
46½	50½	63½	58½	45½

*11 months.

Thus in 1879 the percentage of expenses was nearly as low as last year. The decrease from previous years was not nearly so great then as in 1883, however, the percentage of expenses having ranged from 52½ to 54½ for three years before 1879.

The effect of the cessation of railroad construction on the road's earnings and profits we cannot estimate without knowing what rates have been obtained for carrying railroad materials. These rates are not governed by competition to the same extent as those on some other traffic. The Atlantic & Pacific, for instance, was compelled to depend on the Atchison for carrying its materials. Under such circumstances a pretty stiff rate can be collected, unless it is made a subject of contract before the new road is built, as it ought to be. Then policy may induce the granting of a very low rate, in order to secure a feeder that might not be built if it cost too much. In its last fiscal year the Northern Pacific charged over \$1,500,000 for carrying construction material and passengers, 757 miles of track having been laid during the year. The rate charged has an important effect on net earnings especially.

The relations of the Atchison Company with the Atlantic & Pacific are not such as are likely to be a burden on the former. It guarantees the bonds of the Atlantic & Pacific to the extent of 25 per cent. of its gross earnings on the traffic interchanged with it. It will very likely have to make good its guarantee; but the 25 per cent. of its gross earnings on the traffic interchanged with the Atlantic & Pacific will probably be less than its net earnings on that traffic, and will not be considerable in amount.

There seems, in spite of the enormous net earnings reported, to be some distrust of this company. The stock, which pays 6 per cent. dividends, and last year appears to have earned 9 per cent., and which sold above 95 in the summer of 1882, has been below 70 and is now about 77. Though the cessation or great decline of railroad construction in the Far West is likely to reduce its earnings considerably, the circumstances of the road generally seem to be rather more favorable than those of the average railroad at this time. While the crops of the country at large are much below the average, on this road they have been exceptionally good. The diversion of Pacific traffic by the completion of new routes cannot hurt it much because it has never had much of this traffic. Within a few months it will have the benefit of a connection with a line to the city of Mexico and with the whole Mexican railroad system. We do not think it will get much traffic from this, but it will get something. No one, however, can estimate with any confidence the financial position of this company without fuller information of its traffic and its sources than its annual reports have ever given, and of the details of its working expenses than are contained in this statement, which must be taken only for what it pretends to be, a summary statement in advance of the annual report such as is possible to make so soon after the close of the year.

DECEMBER EARNINGS.

Our table of railroad earnings in December published this week has returns from 75 different railroads, whose aggregate mileage and earnings and average earnings per mile for the month in 1882 and 1883 were:

	1882.	1883.	Inc. or Dec.	P. c.
Miles.....	60,061	55,296	+	4,765
Earnings.....	\$32,937,337	\$32,000,646	+	\$937,691
Earn. per mile..	548	548	—	31

The increase in mileage is so much greater than the increase in earnings that there is a considerable decrease in earnings per mile. This is a worse showing than had been made before for a long time. The increase or decrease in average earnings per mile shown by these tables for the several months of 1883 were:

	P. c.		P. c.
January.....	1.2	July.....	3.0
February.....	4.0	August.....	0.15
March.....	7.2	September.....	Inc. 0.15
April.....	Dec. 2.2	October.....	1.5
May.....	2.5	November.....	Dec. 2.8
June.....	1.4	December.....	5.4

Thus there were but three months of the year when there was not some decrease in the average earnings per mile of the roads reporting, but it was exceptionally great in December. Of the 75 roads reporting 32 had then a decrease in total earnings and 44 a decrease in earnings per mile.

The four roads northwest of St. Paul all had an in-

crease in mileage, all but the Manitoba an increase in total earnings, and all but the Northern Pacific a decrease in earnings per mile. We have noted heretofore how unusually well the Northern Pacific's earnings kept up in December, being little less than in November; the Canadian Pacific felt the winter much more, its earnings falling from \$498,000 in November to \$320,000 in December. The earnings of the Manitoba also fell off about a sixth in December, as is usual. Altogether, these roads give the following results:

	1883.	1882.	Inc. or Dec.	P. c.
Miles.....	3,900	3,923	+	1.977
Earnings.....	\$2,281,036	\$1,008,486	+	\$672,550
Earnings per mile.....	387	410	+	23

Only three roads of the Far West further south have reported, the Union Pacific, the greatest of them all, not yet having made its statement for December. The Atchison for the first time includes the Southern Kansas in its statement, and, without change of mileage, has a decrease of 20 per cent. in earnings; the Denver & Rio Grande, with 44.7 per cent. more road earned 31 per cent. more money. The Central Pacific reports a decrease of \$151,893 (7½ per cent.), but it worked a smaller mileage than the year before, and its decrease in earnings per mile is but 2½ per cent. The three roads together with 353 miles (5.4 per cent.) more road earned \$330,665 (8.2 per cent.) less money, and their average earnings per mile fell from \$619 to \$539.

Ten other roads west and northwest of Chicago report in the aggregate as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Miles.....	12,800	11,997	+	803
Earnings.....	\$5,807,966	\$5,496,940	+	\$311,026
Earnings per mile.....	454	458	+	4

This is a very good showing, but not as good as one as the same roads made in November, when they had an increase of nearly 3 per cent. in earnings per mile. We have heretofore commented on the returns of most of these roads. All but the Northwestern and the Green Bay made an increase in total earnings, but five had a decrease in earnings per mile, and about seven-eighths of the total increase in earnings was made by two roads, the Milwaukee & St. Paul and the St. Paul & Omaha. The chief of these Northwestern roads have already reported for January, and make a worse showing than in December.

There are eleven reports from roads west and southwest of St. Louis, giving the following aggregates:

	1883.	1882.	Increase.	P. c.
Miles.....	7,812	7,704	108	1.4
Earnings.....	\$4,198,807	\$4,089,947	\$108,860	2.7
Earnings per mile.....	537	531	6	1.1

Here first we find an increase in average earnings per mile. Only three roads report a decrease either in total or earnings per mile, and none of the decreases are large. The St. Louis & San Francisco and the Ft. Scott & Gulf made large increases, and probably generally there are gains on the lines in Missouri and Kansas, and losses further south; but as the Iron Mountain is included with the Missouri Pacific, and the International & Great Northern with the Missouri, Kansas & Texas, we are not able to ascertain this on the most important lines. The Texas & Pacific makes a small gain, which was hardly to be expected.

Taking now the roads north of the Ohio and east of the Mississippi and the Chicago & Alton Railroad as far east as Pennsylvania, we find reports from no less than 18, as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Miles.....	9,360	9,010	+	350
Earnings.....	\$3,882,003	\$3,799,377	+	\$82,626
Earnings per mile.....	415	422	+	7

The aggregate result is not so unfavorable as in November and some other months, chiefly because of the exceptionally large gain by the Wabash, which had for the previous eleven months shown a small loss. Only six of the 18 roads have any increase in earnings, and only five an increase per mile; but either the decreases are small or the roads that suffer them are small.

There are reports from 19 roads south of the Ohio and the Potomac and east of the Mississippi, giving the following results:

	1883.	1882.	Inc. or Dec.	P. c.
Miles.....	9,415	9,065	+	350
Earnings.....	\$4,427,159	\$4,372,903	+	\$54,256
Earnings per mile.....	470	482	+	12

These roads until December showed increases in earnings per mile every month, amounting for the 11 months to 9½ per cent. In November the increase was infinitesimal, and now we have a considerable decrease; still 12 of the 19 roads show an increase in total earnings, and nine an increase in earnings per mile. The large decreases are on the Illinois Central's Southern Division, and the Columbia & Greenville, the latter an unimportant road that has always had light earnings.

There are reports from from 10 Eastern roads, which foot up as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Miles.....	7,874	7,052	822	11.7
Earnings.....	\$6,619,912	\$8,591,454	-\$1,971,542	-22.8
Earnings per mile.....	1,095	1,218	-123	-10.1

Just half these roads show an increase in total earn-

ings, and the increases and decreases very nearly balance; but the decrease in earnings per mile is important, and is suffered by seven of the ten roads. A very large gain is made by the Boston, Hoosac Tunnel & Western, but it is a very small road. All the other roads with a trunk-line traffic—the Pennsylvania, the Northern Central and the Grand Trunk—show a considerable decrease in earnings. Excluding the Reading, which included the earnings of the Central of New Jersey last year but not the year before, nine companies with an increase of 202 miles of road had \$473,813 less earnings than in 1882.

We find thus that only a single one of these seven groups of railroads made any increase in earnings per mile last December, and there is reason to believe that in this, the Southwestern system, the gain is made chiefly by lines in Missouri and Kansas.

Effect of the Abolition of Canal Tolls.

The report of the retiring State Engineer, Silas Seymour, on the canals of the state of New York, shows that (with a correction made since the report was issued) the tonnage carried in 1883 was 5,680,200, while the average for the 21 years preceding was 5,600,682, so that the traffic during the first year of the free canal was but 1.4 per cent. more than the average of the previous 21 years. The heaviest traffic was during the seven years from 1868 to 1874, inclusive, which was before the railroads became serious competitors for the through grain. The average for those seven years was 6,255,100 tons, and nearly 12 per cent. more than last year's tonnage; but as recently as 1880 the tonnage was larger than in any of these seven years, except 1871 and 1872. Mr. Seymour argues that the yearly tonnage has not been materially affected in any of the 22 years by the tolls imposed; but this conclusion seems to us unwarranted. It is a fact that the successive reductions of tolls, including the final abolition of them, have not been followed by any considerable increase in canal traffic, but this itself is very strong evidence that if tolls had not been reduced the traffic would have fallen off, and certainly, if the tolls of 1872 had been continued, amounting to 3 cents per bushel on grain, the canal traffic would have nearly ceased long ago. The average rate of freight received by the canal boats for the ten years ending with 1873 was more than 15 cents a bushel for wheat and 13 for corn; for the next four years it was 8 cents for wheat and 6½ for corn; and for the five years from 1878 to 1882 it was 6 and 5½ cents, going as low as 4½ and 4.3 cents in 1881. Now, manifestly, the boats could not have paid a 3-cent toll in the latter period. In some of these years they are said not to have earned their expenses while paying a 1-cent toll. The canal would have dried up long ago if the tolls had not been reduced.

But this is a different question from that of the policy of abolishing tolls. Purely as a business enterprise, without reference to the effect on the state commerce and industry, the state was justified in making any reductions that would preserve traffic for the canal, and yet leave it some margin over the cost of maintaining it. The railroads are doing this, and have to do it, constantly. But as a business enterprise the limits of the reduction are reached when the tolls cease to pay the expenses of the canal. The limit was reached before the abolition of tolls, and of course it is passed now, when the state virtually pays a subsidy, amounting to the cost of maintaining the canal, for the purpose of keeping the boats running. The justification pleaded for this is that it limits the charges of the railroads—that is, causes them to be lower than they are made by the competition among themselves, the competition of the St. Lawrence and Mississippi routes, and the competition of markets not reached by the New York railroads. Now, whether this is true, or to what extent it is true, cannot be ascertained simply by comparing the canal traffic without tolls with that of previous years. The canal expenditures now are substantially a subsidy paid by the state, first for the benefit of certain industries which are certainly benefited by the canal, second to attract a larger traffic through the state of New York, the advantage of which is confined almost entirely to the cities of New York and Buffalo and the boat-owners, and third to keep down railroad rates, which, so far as through business is concerned, helps Montreal, Boston and Baltimore as much as it does New York. The canal certainly does increase the grain exports of New York city. Not all the grain which it carries would go to New York if it had to be moved by rail, but would reach other ports. But there is no more reason for paying a subsidy for a canal to secure this object than there is for paying a subsidy for an additional rail-

road, unless the canal will have greater effect than a railroad, in proportion to the subsidy paid. The essential thing to understand is that the cost of maintaining the canals (last year \$664,446) is really a subsidy paid for the encouragement of the commerce and industry of the state of New York, and the success of the canals must now be judged by their effect in this direction, for they are no longer in any sense business enterprises. The abolition of tolls is in effect a domestic protective tariff, intended to encourage industry by a public tax used to reduce the expenses of the manufacturer or merchant, while a protective tariff is intended to encourage it by increasing his receipts. The tax on the public is direct in the case of the free canals, as it pays taxes to pay for maintaining them; it is indirect in the case of the tariff, the tax being paid in the shape of higher prices for commodities consumed. It is claimed for both that the total effect is a benefit for the taxpayers, reducing their other expenses or increasing their incomes to an extent greater than the tax. To ascertain whether this is true or not cannot be ascertained by examining the gross amount of goods imported and duties paid in the case of the tariff, nor can it be by examining the total tonnage and cost of maintenance of the canals; and in the latter case the experiment has not lasted long enough to make it possible to learn even approximately what the effect has been. It only appears that the free canals are not likely to have a largely increased tonnage—that the abolition of tolls, like previous reductions, so far as canal traffic is concerned, may prevent a rapid decrease, but is very unlikely to cause a considerable increase. With two new railroads between New York and Buffalo, hungry for business, there may even be a further reduction of canal traffic, but if so we may be sure that the reduction would have been greater but for the abolition of tolls.

January Earnings.

January earnings have been reported so far by 20 railroads, with the following results:

	1883.	1882.	Inc. or Dec.	P. c.
Miles worked.....	22,328	20,719	+	1,609
Earnings.....	\$8,459,488	\$8,385,543	+	\$73,945
Earnings per mile.....	379	405	-	26

Among the roads reporting are the great systems of the Milwaukee & St. Paul, the Chicago & Northwestern, the St. Paul & Omaha, the Manitoba, the Illinois Central, the Denver & Rio Grande, and the Louisville & Nashville. Of these the three first named, northwest of Chicago, all show some increase in earnings, and their aggregate increase is considerable, amounting to \$243,601, which is 8 per cent., while their increase in mileage was only 5 per cent. But this result appears less favorable when we compare with 1882, for there was a decrease by all of them from 1882 to 1883; and even last January, with a great increase in mileage, the Northwestern has smaller and the St. Paul very little larger total earnings than in 1882, and the aggregates of the three roads in January of the three years were:

	1882.	1883.	1884.
Miles.....	8,230	9,203	9,751
Earnings.....	\$3,406,801	\$3,028,799	\$3,272,100
Earnings per mile.....	418	336	336

Thus, with 19 per cent. more road than in 1882, these three roads earned 4 per cent. less money, and their average earnings per mile were reduced 20 per cent. in the two years. Their earnings were materially reduced by snow blockades in January last year, and a little this year.

The other Western roads reporting do not show particularly notable changes. The Central Iowa makes a gain about in proportion to its great increase in mileage; the Chicago & Alton makes a slight gain, which is in addition to a large gain last year; the Manitoba has a large loss (8.2 per cent.), but it is not so large as its loss in November and December; it did not begin to lose until after January last year. The St. Paul & Duluth makes a trifling gain.

The Illinois Central (all three divisions) shows a decrease which is a little smaller amount than in December, but a larger percentage. Its decrease in December was large both on its Illinois lines and its Southern Division. The earnings of the latter have fluctuated greatly from January to January, as may be seen from the statement of them below:

	1878.	1879.	1880.	1881.	1882.	1883.
Jan.....	\$373,489	\$314,936	\$396,082	\$346,443	\$372,709	\$467,410

The very small earnings of the division in 1882 were after the very bad crops of 1881; the crops were not good last year on this line, and a considerable decrease was to be expected. The total Illinois Central earnings in January, including the Southern Division, whose monthly earnings in years previous to 1882 have not

heretofore been published, have been as follows for six years:

1879. 1880. 1881. 1882. 1883. 1884.
\$805,128 \$992,194 \$977,721 \$1,019,453 \$1,058,620 \$919,900

We therefore have to go back to 1879 to find a January when this company's earnings from all its lines were as small as last January. Curiously, though the crops in Illinois and Iowa in 1881 were exceptionally bad, the traffic in December and January following was exceptionally good, the movement of the crops having been concentrated in those months to an unusual extent.

Compared with previous months, we have the decrease of \$138,720 in January to set against the larger loss of \$144,460 in December, and a gain of \$58,078 in November.

Further east of Chicago and St. Louis we have so far reports of three roads—the Chicago & Eastern Illinois showing a decrease of 9.2 per cent. in January, against a trifling increase in December and a larger decrease in November; the Detroit, Lansing & Northern losing 16.4 per cent. in January, against 12 per cent. in December and 6 per cent. in November; more significant still, the Chicago & Grand Trunk, which had gained an average of \$62,483 per month in the first ten months of 1883, and gained \$32,387 in November and \$13,875 in December, had a decrease of \$22,059 (11½ per cent.) in January. It should be said, however, that the lines from Chicago eastward had unusually large earnings in January last year, and this road especially, making an increase of 58 per cent. over 1882.

Southwest of St. Louis the St. Louis & San Francisco makes an increase of 14 per cent., against 24 per cent. in December, 20 per cent. in November, and 8½ per cent. last year. South of the Ohio the Louisville & Nashville suffers a decrease of 7½ per cent. in January, while it made a slight gain in December, and one of 6 per cent. in November, and the Mobile & Ohio, which had a decrease of 7.2 per cent. in November and one of 3½ per cent. in December, reports a decrease of 14.2 per cent. in January, and in net earnings one of 35½ per cent. In the East the Long Island gained 3 per cent. in January and the Rochester & Pittsburgh 161½ per cent., the latter's increase in mileage having been 135 per cent., and its earnings per mile this year only \$229.

We do not know how the course of earnings for the last three months can be made more clear than by the following table, which gives the amount and percent age of increase or decrease in earnings compared with last year in each of these months for each of the 18 roads. A glance at the figures will show whether a road has been improving or the reverse in comparison with last year:

	Amount of Inc. or Dec.		
	Jan.	Dec.	Nov.
Central Iowa	\$33,609	\$10,008	\$30,891
Chic. & Alton	14,427	31,040	36,875
Chic. & E. Ill.	12,773	831	18,529
Ch. & G. T.	22,659	13,875	32,387
Ch. Mil. & St. P.	107,801	186,293	315,027
C. & N. W.	104,700	20,300	248,368
C. St. P., M. & O.	31,100	63,390	55,758
D. & Rio G.	26,403	137,450	146,700
Det. L. & Nor.	16,578	14,808	8,902
Ill. Cen.	138,720	144,640	58,078
Long I.	3,898	3,632	9,834
L. & Nash.	81,735	11,345	74,003
M. L. S. & W.	4,323	2,880	20,272
Mobile & O.	30,673	10,691	21,742
Rich. & Danv.	800	12,192	782
Roch. & Pitts.	41,570	63,178	54,181
St. L. & San Fran.	41,357	81,700	67,360
St. P. & Duluth	1,307	2,031	4,365
St. P., M. & M.	40,356	54,035	67,821
Shen. Valley	4,567	15,933	21,298
Total	\$71,945	\$389,960	\$1,059,985
	P. c. of Inc. or Dec.		
	Jan.	Dec.	Nov.
Central Iowa	43.5	15.7	34.3
Chic. & Alton	2.2	4.4	4.1
Chic. & E. Ill.	9.2	0.6	11.4
Ch. & G. T.	11.6	6.0	13.9
Ch. Mil. & St. P.	7.9	9.5	15.2
C. & N. W.	7.7	1.1	11.8
C. St. P., M. & O.	9.9	16.6	10.8
D. & Rio G.	5.9	31.0	24.7
Det. L. & Nor.	16.4	12.1	6.1
Ill. Cen.	13.1	10.8	4.6
Long I.	3.0	0.9	5.7
L. & Nash.	7.3	2.3	6.2
M. L. S. & W.	6.7	3.7	25.8
Mobile & O.	14.2	3.5	7.2
Rich. & Danv.	0.3	3.8	0.2
Roch. & Pitts.	161.5	225.6	172.9
St. L. & San Fran.	14.0	24.0	20.3
St. P. & Duluth	1.8	2.2	3.8
St. P., M. & M.	8.2	7.2	7.4
Shen. Valley	12.4	33.9	37.4

In the aggregate we see that these 20 roads, which in November gained more than a million over the previous year and in December nearly \$400,000, in January gained but \$72,000.

Four gained more in January than in December, but none gained as much in January as in November, though the Manitoba lost less; three which gained in December lost in January; but two (the Northwestern and the Long Island) which lost in December gained in January; and eight that gained in both months gained less in January than December, and 12 less in January than November. The greater changes since November are on the Milwaukee & St. Paul, the Northwestern, the Denver & Rio Grande, the Louisville and Nashville and the Shenandoah Valley—all making a less favorable showing last month.

Through Freight over the New York & New England.

The New York & New England Railroad, it is reported, will give up entirely all competition for through freight from the West to Boston, but continue to carry it to the local points on its line. This is a remarkable step for the management to take. It may be said that the whole effort of the late management was given to preparing for and developing this through traffic. For this the road was extended from Waterbury to the Hudson River, its rolling stock greatly increased, and a large amount expended for second track, sidings, etc., and for this the enormous and extremely valuable terminal grounds in Boston were secured and improved. During last year it was made the Erie's chief Boston connection, and for the Erie alone it carried from Boston and the other places which have Boston rates about one eighth of the whole through westward shipments of these places, and perhaps as much more for the Pennsylvania Railroad. Apparently it carried more than half as much as the Boston & Albany of the Boston shipments westward in this first year of the operation of its Newburgh connection with the Erie.

The business was not profitable last year, doubtless. It probably caused a considerable loss. But it does not follow that the road can never make anything out of its through business. It is a hard road to work, and last year—at least in the first part of it—was trying to do a through business when not properly prepared to do it economically. But it ought to be possible to fit the road to do the work economically—with not much greater cost than is incurred on the other railroads between Boston and the Hudson River. An enormous sum has already been spent to secure this traffic, and the question now is not whether this has been wisely spent, or whether the traffic secured thereby will yield an adequate income on the capital already expended; that capital is gone beyond recall and must be made the most of. If \$10,000,000 have been spent to secure the through traffic, and the business secured yields no income on this capital, still, if, by spending \$1,000,000 more, the profit on the business will be \$100,000, it will be for the advantage of the company to make the additional expenditure, if it can get the capital for less than 10 per cent., though then the income will be less than 1 per cent. on the whole \$11,000,000 expended.

If, however, at this time, notwithstanding all the expenditures made (which the last report indicated to have rendered the road capable of carrying the through freight at some profit), the through business can be carried only at a positive loss—if the working expenses will be reduced more than the gross receipts by abandoning the business—it may well be expedient and almost necessary to abandon it; for the Receiver can hardly secure much new capital to improve the road when the road is not earning the interest on the old capital. The established through traffic of the road, however, is one of the values of the property which the Receiver is appointed to conserve; and bondholders as well as stockholders are interested in having this resource, though it may be a resource for future and not for present profit, maintained and developed.

It may seem strange to some that through traffic between Boston and the Hudson River should be less valuable than that between Buffalo or Pittsburgh and New York, in proportion to distance; but it is much less valuable. Rates from Boston and New England to the West are the same as from New York, so that if the trunk lines east of the Hudson received the same on New England as on New York business the New England road would receive nothing for the transportation. Export freight eastward also receives a rebate which makes the rate equal to the New York rate. Of course the rate has to be divided so as to leave the New England road something—usually as much per mile as the roads west of the Hudson get. In the case of the Hoosac Tunnel line and the Boston & Albany this does not much reduce the rate per mile; the distance from Chicago to New York being 903 miles via Albany, and from Chicago to Boston 1,010 to 1,020 miles, and the rate per mile on a 30-cent rate being thus 0.623 cent to New York and 0.588 to 0.594 cent to Boston (modified in both cases by the terminal charge). But when freight goes to Boston by way of the Pennsylvania or the Erie and the New York & New England, the division is more unfavorable to the New England roads. The distance is 1,141 miles by the former, and by the Erie it is 1,180 from Chicago to Boston; a 30-cent rate is 0.658 cent per ton per mile to New York and 0.526 cent to Boston by the Pennsylvania; and 0.609 cent to New York and 0.509 cent to Boston by the Erie. The difference between the New York and the Boston rates per mile on the New York & New England's total through business last year, amounted to \$103,400, which is all difference in profit,

and the company's profit from through and local freight both was but \$175,000 last year.

There must be a very small margin for profit, if any, on export grain to Boston and other low-class freight over such a route as this, which must accept lower rates per mile and pay a larger expense per mile than some of its competitors. But the Grand Trunk route suffers more than the New York & New England in this respect—has lower rates, though perhaps smaller expenses.

The larger part of the west-bound freight, however, is of a higher class, and the regular rate on much of it is 2½ times as great—75 cents per 100 lbs. instead of 30. It pays to carry this freight over the longest routes. But last year full rates were not obtained for much or most of it by the New York & New England route, and doubtless much of the time not by the others, which made such reductions that the proportion of business going by the Central Vermont and the Grand Trunk, whose regular rates are about a fifth less than those by the other roads, was greatly reduced.

The rate actually obtained by the railroad east of the Hudson may, however, be more than its proportion of the whole length of the through line; that is as the different roads in the line can agree. A road like the Erie or the Pennsylvania rather than abandon the whole New England business and the profit on it will share the whole profit on it so as to leave some advantage from the business to its Boston connection, even if it gives the latter twice as much profit per mile as it gets itself; but if more than one route is open to it (as the Erie has the Tunnel line and the New York & New England), it is likely to get the best terms possible by the competition of these routes with each other. But it is evident that the railroads to New York which make their Boston connections at or near New York have an interest in having as much of the through business as possible done at New York rather than Boston. They get the whole of the profit from the same gross receipt if the business is done at New York, and only four-fifths of it at most if it is done at Boston—less than that actually, because they then lose the terminal charge, on which we may assume that there is some profit. Still, the railroads are compelled to submit to many alliances in which such disadvantages exist. It being certain that there will be a Boston business which will be carried by some road, every road to New York desires to have a part of that profit. If it could make all the business go to New York it would like it better; for the business which gives it a profit of a dollar when it goes to Boston might yield it a profit of two dollars if it went to New York. But as between a profit of a dollar and no profit at all it prefers the former.

The Grand Trunk Railway reports a decrease of no less than 36 per cent. in earnings in the first 12 days of January, while previously for a long period it had showed some increase; and its controlled roads also report large decreases at the same time; the Chicago & Grand Trunk 30½ per cent., and the Detroit, Grand Haven & Milwaukee 39 per cent. And there is reason to believe that the other trunk lines and their western connections also suffered decreases at this time. These were not, however, so serious and significant as might be supposed, because there were several circumstances, some of them accidental, which conspired to bring about the result. In the first place, there was considerable obstruction by snow early in January, from which probably the Grand Trunk suffered more than any other roads with the possible exception of the Michigan Central. In the next place, traffic was exceptionally heavy on such lines last year—witness the Chicago shipments, which were 131,934 tons in the first two weeks of January last year, against 125,913 in 1882, when the rates were not half as high; 127,013 in 1881, when they were very much larger than had ever before been known in winter, and 71,409 in 1880. Third, the traffic offered was exceptionally light this year, the Chicago shipments having been but 87,816 tons this year. Business would not have been good if nothing had happened; it was lessened by bad weather, which prevented local more than through shipments, and even good earnings would have made an unsatisfactory comparison with the exceptionally good ones of last year.

The Long Island Railroad Company controls substantially all the railroads of Long Island, except some excursion railroads between Brooklyn and the seashore. Long Island, however, is not the best place in the world for a railroad to thrive. Its situation isolates it from the railroad system of the continent. None of its lines serve as a thoroughfare for the traffic of other lines. The 354 miles of the railroad have thus to be supported by the island itself, which has an

area of but 1,056 square miles, or three square miles per mile of railroad, and not a little of this is barren, though some of it is exceptionally fertile. The population is abundantly sufficient to support a railroad, but of the 714,000 inhabitants on the island in 1880, no less than 616,000 lived on the extreme western end, where they have very little occasion to use the Long Island Railroad, and all but 23,900 lived within 30 miles of New York, leaving the 23,900 scattered over the eastern 80 miles. Then scarcely any spot on the island is more than seven or eight miles from some bay on the Sound or the ocean, which would have a great effect on freight rates were there much heavy freight on the island (which there is not). The result is a peculiar set of circumstances hardly comparable to anything elsewhere in the country. The railroad system is made up largely of a number of suburban lines which extend but a short distance from the west end of the island, and which have not a very large regular traffic, though some of them in summer have an enormous excursion traffic, and in the season there is also an important travel over the longer lines to summer resorts in Eastern Long Island, a travel which has been increasing decidedly of late years.

The Long Island Railroad Company has reported its earnings and expenses for the fiscal year ending with September last, and we give them below, compared with the results in previous years:

	1883.	1882.	1881.	1880.
Gross earnings.....	\$2,685,090	\$2,417,057	\$1,946,668	\$1,811,849
Expenses and taxes.....	1,683,814	1,576,775	1,756,372	1,365,556
Net earnings.....	\$1,001,276	\$840,282	\$190,296	\$445,991
Interest and rentals.....	491,527	393,505	385,341	393,520
Surplus.....	\$509,749	\$446,777	\$195,045	\$52,473
Dividends.....	400,000			

*Deficit.

There has been an increase of but 34 miles of railroad in this time, 18 miles of which is the leased Manhattan Beach—solely an excursion road.

Altogether last year the earnings were \$7,585 per miles of road gross and \$2,828 net per mile of road—quite moderate amounts, yet the largest that the company has ever made. They sufficed to pay interest and 4 per cent. on the \$10,000,000 of stock of the company.

The company owns but little more than one-half of the 354 miles which it works, 170 miles of it being leased, and consequently its capital stock and the \$4,800,000 of its funded debt represent only 184 miles of railroad, and amount to \$26,000 of bonds and \$54,348 of stock per mile of road. The rental paid last year for the other 170 miles of road was \$282,467, which is at the average rate of but \$1,662 per mile.

A very great increase is shown in the gross and net earnings of this company since 1881. For more than three years previous to 1881 the road had been in a receiver's hands. In 1881, however, probably large reparations made were charged to expenses—at least the reported working expenses were 90 per cent. of the gross earnings, and the net earnings were not half as great as the interest and rentals. In 1882, with an increase of \$470,000 in gross earnings, there was a decrease of \$180,000 in working expenses, so that the net earnings increased from \$190,000 to \$840,000—an increase of 342 per cent. After so great an increase, a small gain should be satisfactory; but gross earnings increased 11 per cent., and net earnings 19 per cent. last year.

The company with this statement for the last fiscal year, has submitted a statement of its earnings for the October-December quarter of the current fiscal year, showing an increase of 3½ per cent. The character of the traffic of the road may be inferred by the great contrast between the earnings in this October-December quarter with those of the preceding quarter, including July, August and September, when excursion traffic and the movement to and from seaside resorts is greatest, as follows:

	July-Sept.	Oct-Dec.	Decrease.	P. c.
Earnings.....	\$1,659,345	\$551,803	\$507,542	92.0

And the July-September quarter yielded nearly 40 per cent. of the gross earnings and 53 per cent. of the entire year ending with September. For the nine months ending with June the net earnings had been at the average rate of \$52,222 per month; for the next three months they were \$177,093 per month.

The land grants of the Union Pacific, the Kansas Pacific and the Denver Pacific railroads, now united in the Union Pacific Railway, together amounted to about 18,204,000 acres. For about 200 or 250 miles west of the Missouri this was generally agricultural land, and much of it very fine; further west it was chiefly grazing land or in the mountains. About 4,000,000 of the lands has been sold, nearly all agricultural land, and doubtless including most of that land. The sales have amounted to about \$15,500,000. The government directors estimate the value of the remaining 14,000,000

acres of land to be \$17,500,000, which is probably much in excess of their actual value. Ranchmen are slow to buy land at any price, and they cannot afford to pay much for grazing lands when finally they are forced to buy, because it requires perhaps 20 times as much plains land as of grass land in a rainy country to keep the same number of animals. But even should they pay \$1.25 per acre and there should be absolutely no waste, it will be a great many years before the land is all sold. In 1882 less than 260,000 acres were disposed of. Should the sales be at twice this rate hereafter, it would be about 28 years before they were all sold, and the company would have to hold them on the average 14 years longer. Now, if the lands should sell eventually for \$17,500,000, but must be held on the average 14 years, their present value is less than \$8,000,000. Generally the value of the Pacific Railroad land grants has been vastly exaggerated, though the Union Pacific, the Kansas Pacific and the Northern Pacific did have a very large amount of very valuable land. All these, however, and still more the Central Pacific, the Southern Pacific (if it gets it) and the Atlantic & Pacific have a very much larger quantity of very poor land, much of which, so far as we can see, will never be sold at any price, and most of it only at low prices and quite slowly. The Texas & Pacific land grant in New Mexico and Arizona is perhaps the most worthless of all, unless the Atlantic & Pacific's is poorer, and the Southern Pacific will not suffer a great direct loss if it does not get it, though the ownership of the land, however worthless, would probably make its bonds sell better.

The Delaware, Lackawanna & Western is reported to be negotiating for the purchase of a number of lake propellers with which to establish a line of its own between Buffalo and Chicago and other upper lake ports, instead of depending upon chartering vessels. A propeller line in its own interest, whether owned or chartered by it, would seem to be a necessity for this company. All the other companies have found it necessary, and its lake connection was the chief protection of the Erie during the long period when it had no railroad connections under its own control. The Lackawanna should find such a line still more necessary to it, because it is a new road, and has as yet but meagre railroad connections west of Buffalo. Moreover, it has, or may have, an exceptionally large amount of freight to ship by lake from Buffalo—namely, its coal. This, however, has been mostly carried heretofore by sailing vessels. The ability to give full loads in both directions should give the Lackawanna a decided advantage in chartering vessels, however. It has been a matter of surprise that it did not make more use of its lake connection last year, the first year of its existence, when it was particularly desirable to make itself felt. But actually the share of the grain and flour which it carried to New York was almost insignificant, only 4,581,770 bushels out of a total of 124,336,237, 3½ per cent. of the total New York receipts and 5½ per cent. of its receipts by rail. The Erie carried six times and the New York Central seven times as much of the New York receipts, besides their heavy New England business, of which the Lackawanna had substantially no share.

There is one objection to cultivating a lake connection, however, and that is the effect it has on the shipments that can be given to the rail connection west of Buffalo. A trunk line connection to a road west of Buffalo is valuable to it about in proportion to the traffic which it can give it. The Grand Trunk, for instance, finds no difficulty whatever in getting any road to carry eastward what it brings to Buffalo on Suspension Bridge; but it wants reciprocity—wants the road to which it brings business to give it business in return. Aside from coal and salt, the west-bound shipments are not large in amount, but they are largely high-class goods, the rates on which are two or three times as great as those on grain eastward. About three out of four of the cars going east with grain or provisions return to the west empty. Now a road like the New York Central, with numerous established western connections, is likely to put its west-bound freight in the cars of these connections and send the Grand Trunk cars back empty. The Grand Trunk wants a connection which will not do this, and so does every line west of Buffalo. And to the extent that a New York-Buffalo line ships merchandise from Buffalo to Chicago by propellers is it a less desirable connection of a railroad west of Buffalo.

The ability, to carry such freight through to Chicago without reference to any connection is, however, a very desirable power. When navigation opens nothing that the railroads west of Buffalo can

do can prevent a trunk line which owns a lake steamer line from delivering merchandise in pretty good time at all the lake ports, and this gives it a power over rates which has to be respected, for the rail-and-lake lines from the seaboard to Chicago is so nearly equal to the all-rail lines that most of the merchandise will go by the former if the rate is very much lower.

Mr. Arthur T. Hadley, Instructor in Political Science at Yale College, and now engaged in giving a course of instruction on railroad economics, begins in this number a series of articles on English railroad policy—the relations of the railroads to the public, the limitations imposed upon them by law, and the historical development of their status. As England is the only important European country where railroads have had a comparatively free development, the result of the policy there and the modifications of it which it has been thought necessary to make have a special interest to Americans. Unfortunately a fatal defect of English railroad statistics makes impossible a direct comparison of the services performed by the English railroads, their cost to the companies and their price to the public, with the same in other countries. We shall not be able to say from statistics whether the British system has furnished cheap or dear service; but the development of the great systems, the evils complained of by the public, the steps taken to remedy these evils, and the way in which they have been modified are full of interest and instruction for us.

Immigration and Population.

The arrivals of immigrants in December and for the calendar year are reported as follows by the Bureau of Statistics for the last three years:

	1881.	1882.	1883.
December.....	37,037	25,868	23,766
Year.....	719,868	712,542	560,196

The decrease in 1883 compared with 1882 was almost wholly previous to August, and in the last five months of the year the arrivals have been:

	1881.	1882.	1883.
Aug. to Dec.....	271,750	205,497	192,131

This is an indication that immigration has ceased to decrease rapidly, though it cannot be trusted entirely, for not only are these the months when immigration is always comparatively small, but when it varies least. Immigration is rarely very large except during the four months from April to July inclusive, when 51 per cent. of the whole number arrived in 1881, 55½ in 1882, and 53½ last year.

The number arriving last year is small only in comparison with the arrivals of the two previous years, which in 1880 were 586,068, or 26,000 more than last year, and smaller numbers in every previous year. Immigration last year added a trifle more than 1 per cent. to our population. In 1881 it added about 1.4 per cent. The increase of population by the excess of births over deaths must have been about 1,090,000 last year, and the total population at the beginning of 1884 cannot have differed much from 58,000,000, the increase of 6,000,000 since the Census having been due to a greater extent than ever before to the unprecedented immigration, which in these 3½ years has amounted to 2,295,888, while the increase of these immigrants has probably been at least 65,000 more. This makes the increase of the total population in about one third of this decade just about 11½ per cent., and should it continue at this rate, by the next census the population would be just about 70,000,000, or 40 per cent. more than in 1880, while the increase from 1870 to 1880 was only 30 per cent., and generally as countries grow older their rate of growth becomes slower. And it is entirely improbable that the growth for the remaining two-thirds of this decade will be as great as it has been during the first third; if it shall be, the immigration must continue at the unprecedented rate of the last three years; and be very considerably greater in amount, averaging 753,000 a year in the second third of the decade, and 864,000 a year in the last third, and amounting to 7,700,000 for the whole decade. But immigration has already fallen off, and will almost certainly not increase for at least one year, and the largest numbers of immigrants that ever arrived in this country in one decade were 3,592,000, from 1874 to 1883, 3,113,000, from 1864 to 1873, and 3,152,000 from 1848 to 1857. There is nothing to indicate that Europe can keep up the immigration at the rate of over 700,000 a year which we have had for two years, not to say increase it, and it will be very unlikely to do so unless there is distress there to an extent now unlooked for.

But the very heavy immigration of the first third of this decade makes it more probable than it was at its beginning that the increase in population from 1880 to 1890 will be at as great a rate as from 1870 to 1880, namely, 30 per cent., which would make it 65,000,000 in 1890. The large immigration has come at the beginning of the decade (it did from 1870 to 1880, however), and it will therefore be multiplying during the rest of it. Starting from the present time, the 9,000,000 required to make the population 65,000,000 in 1890 will be obtained by an average yearly increase of 2½ per cent., while the average yearly increase for the whole of the last decade was 2½ per cent., and aside from all immigration it has averaged 2 per cent. for many years. Thus the immigration might fall off immensely, and in

fact almost cease, and we should still gain 30 per cent. from 1880 to 1890. Two per cent. a year for the 6½ years from the beginning of 1884 till the census of 1890 is taken will increase our present population from 56,000,000 to 63,900,000.

Doubtless this rate of natural increase cannot continue to be 2 per cent. very long. We can only say that the records of immigration and the census prove that that has been the rate for many years previous to 1880. Should it continue till 1890 and for three decades longer our population, without any immigration, after 1890 would be:

1880	1900	1910	1920
55,000,000	79,200,000	96,500,000	117,800,000

While if the increase in the last three decades shall be as it was in the last, and the immigration in the remainder of this decade shall be one-half as great as in the past three years, the figures will be:

1880	1900	1910	1920
67,000,000	87,000,000	113,000,000	147,000,000

The immense difference in the later decades between these two bases of estimating will be noted. For 1890 the second estimate is probably the more correct, but for the succeeding ones we suspect that it is less so, and that for the later ones the former is so exaggerated. Even were it correct, however, it would give us in 1920 less than 1,000 inhabitants per mile of railroad already built, while Europe has a population of more than 3,000 per mile of railroad.

And if we increase our railroad mileage until 1920 at the same rate as from 1870 to 1880, which included seven years when the construction was considered very small, we shall have 982,000 miles by 1920, or a mile to about 150 inhabitants, even at the most rapid rate of growth. Of course we shall not build anything like as much railroad, but this statement illustrates well what we have been saying for years, that the increase in railroad construction at a vastly greater rate than the increase in population cannot continue many years, and that when the disproportion is very great for a few years only it is likely to bring disaster. An addition of about 3,500 miles in 1884 would probably be just about at the rate of increase of the population, and leave as many people per mile of road at the end as at the beginning of the year.

Chicago through rail shipments eastward for the week ending Jan. 26 were but 41,095 tons, and for five successive years the shipments of this week have been:

1880	1881	1882	1883	1884
41,775	65,870	80,525	45,029	41,095

Thus the shipments this year were smaller than in the corresponding week of any of the other four years, 8½ per cent. less than last year, 49 per cent. less than in 1882 (when enormous quantities of grain were forwarded on contracts at 10 and 12½ cents, and notice of an advance of rates had been made already), 38 per cent. less than in 1881 (the rate being 35 cents), and 1½ per cent. less than in 1880, when the rate was 40 cents, against 30 cents this year, while some of the shipments this year were at the 20-cent rate of Jan. 5 to 13, and probably many others at cut rates somewhere below 30 cents. The profit on the business must have been very decidedly less than in any other year except 1882 (when there could have been no profit, because the rate was so low), and not half as great as in 1880.

For seven successive weeks, or rather periods, the shipments (rate per week) have been:

Week ending					
Dec. 14.	Dec. 21.	Dec. 28.	Jan. 4.	Jan. 11.	Jan. 18.
54,193	44,480	37,442	24,795	48,394	65,559
					41,095

Thus in the last week the shipments were the smallest for three weeks and 37½ per cent. less than in the previous week, which indicates that the shipments at 20 cents had mainly ceased by Jan. 20. It is the natural effect of a large reduction for a short period that shipments should be anticipated while it is in force, so reducing the amount forwarded directly after it expires. Should one or two more reductions of the kind (to meet cuts) be made this winter, it would probably lead shippers to hold longer than they otherwise would, in hopes of another reduction, and so would affect business very badly. But this effect is nothing compared with that caused by secret cutting, and the object to be gained by the open reduction to meet secret cuts is worth much more than one winter's business. From January till April there should be 400,000 to 500,000 tons shipped to the East from Chicago alone—perhaps two or three times as much from all Western points. The difference between a 20 and a 30-cent rate on this Chicago business is a difference of from \$800,000 to \$1,000,000 in the profits of the railroads. If things go on as they have been going the lower rate will be received on probably half or two thirds of the business, possibly on much more, and some places and individuals will get the benefit of the low rate, while others will not, and will have legitimate cause for complaint. If open reductions are made from time to time to meet the secret cuts, all shippers and all places will fare alike at all times; the rates will be maintained most of the time, though the larger part of the shipments may very likely be made during the comparatively short period that the reduced rates are in force. Some and perhaps all of the roads will make less this winter under the policy of open reductions, but before navigation opens the secret cutting of rates will probably be abandoned, because it will do no one any good.

For the week ending Feb. 2 the incomplete report of through and local shipments of flour, grain and provisions from Chicago eastward gives a total of 44,477 tons, against 46,051 in the corresponding week of last year, and 53,443 tons in the previous week of this year. Of the total ship-

ments last week, 10,023 tons were flour, 27,065 grain, and 7,389 provisions. The falling off from the previous week is chiefly in grain.

There has been much talk recently of the great exports of wheat from India, and the immense increase in them. But the figures are not so great as many suppose, perhaps. In 1883 the imports of wheat and flour into Great Britain were equivalent to 161,514,475 bushels of wheat, of which 20,987,860 bushels (13 per cent.) came from India, and 77,638,580 bushels (48 per cent.) from the United States. The Indian exports last year were larger than ever before, 33 per cent. more than in 1882, and 54 per cent. more than in 1881.

We noticed recently the live-stock receipts at Chicago last year, and the proportions carried by the several roads from the West. The shipments are chiefly confined to a few roads to the East. In car-loads they were for the last two years:

	No. cars.	P.c. of total.		No. cars.	P.c. of total.
	1883.	1882.		1883.	1882.
Lake Shore.....	20,590	25,320	28.0	35.2	
Mich. Cen.....	16,978	18,061	23.1	25.3	
Ft. Wayne.....	11,455	10,902	15.6	23.6	
Nickel Plate.....	7,183	33	9.8	...	
C. St. L. & P.....	5,170	272	7.0	0.4	
Balt. & Ohio.....	2,607	2,684	3.6	3.8	
C. & G. T.....	967	3,247	0.9	4.5	
Chic. & At.....	3,448	...	4.7	...	
Other roads.....	5,356	5,145	7.3	7.2	
Total.....	73,460	71,561	100.0	100.0	

There was a slight decrease in the amount shipped, but the remarkable fact shown is the much greater distribution of them. Besides the two new roads, which took 14½ per cent. of the whole (though the Chicago & Atlantic was open little more than half of the year), the Chicago, St. Louis & Pittsburgh, which had not done a live-stock business previously, entered the field, with such success as to take 7 per cent. of the shipments, which, however, substantially all came from the share of the Fort Wayne, the other Pennsylvania road. On the other hand, the Chicago & Grand Trunk reduced its shipments four-fifths, which is because it carried fresh beef instead of live cattle, doubtless. The result is, substantially, that it, the Michigan Central and the Lake Shore, lost what the Nickel Plate and the Chicago & Atlantic gained—the first three lost 8,093 cars, and the two new ones gained 10,598. This is a valuable business when rates are maintained, and the diversions of it to and from different roads have considerable significance. The Chicago & Atlantic having been open but about half the year, its 4.7 per cent. is at the rate of 9.4 per cent. of a year's business—nearly the same as the Nickel Plate's share. The Baltimore & Ohio's shipments were apparently not affected by the entrance of the new roads, and as it carries chiefly to Baltimore and Washington it was not to be expected that they should be. The Michigan Central was less affected than the other leading live-stock carriers, and nearly maintained its rank. The Vanderbilt roads together carried 60.5 per cent. of the whole in 1882, when there were two of them, and 60.9 in 1883, when there were three of them. The two Pennsylvania roads carried 24 per cent. of the shipments in 1882 and 22.8 last year.

The "other roads" include the lines to the West, on one of which last year and on three the year before more than a thousand car-loads were shipped—perhaps stock cattle.

The canning of salt beef, which is comparatively a new business, now requires an enormous number of cattle—many more than were formerly packed in barrels. In Chicago down to 1876 there had never been as many as 100,000 cattle packed. In 1883, 504,987 were used in the canned beef trade alone. The whole of the animal is not canned, by any means, the choicer cuts being sold for consumption fresh. Even in 1882 the canners took only between 280,000 and 300,000 cattle at Chicago. This business is prosecuted on a large scale at St. Louis and Kansas City also, and doubtless no inconsiderable proportion of the ranch cattle are consumed in this way. The product is exported very largely, and if we can produce the cattle cheaply enough there will probably be a demand for several times as much as we have exported heretofore.

The Prussian government made an offer for the Berlin & Hamburg Railroad which the owners are disinclined to accept. The government, however, intimates that it will make no better offer, but will take possession by "sequestration," under a law passed in 1883, if its offer is not accepted. By this law it is entitled to take any railroad at any time on paying 25 times the average dividend of the five years previous to that when it exercised its option. If it exercised this option before the end of 1883 it would have to pay 15 times 14.55, the latter being the average dividend of the past five years. A larger dividend was expected for 1883. But at this price the stock would bring 371½, and there would remain the profits of 1883 to be divided in addition. On the announcement that the company had failed to come to terms the stock rose 6½ points, to 407, but the financial authorities disagree as to whether this was justified, some apparently holding that the government offer amounted to fully as much as would be obtained under the law for sequestration.

It would probably delight the stockholders of the Pennsylvania, the New York Central, the Boston & Albany, the Rock Island, the Burlington, or the Union Pacific, if the United States would condemn their property and pay them 25 times their average dividends for the past five years for their stock, especially if it paid them in long-date government 4 per cent. bonds, as Prussia does. A bill to curb the railroads by government competition, providing for purchases on such terms, would give such a boom to the stock market as the utmost efforts of the great stock-owners cannot

manufacture. There is a chance for a speculation in it something like that in whiskey, when Congress imposed a tax of \$2 per gallon, which did not apply to stocks on hand. To get \$175 in government 4's worth 120 to 124 for Union Pacific stock would be better than a "corner" for holders, and perhaps if one happened to be a member of Congress and happened to have invested \$1,000 in margins on a hundred shares, bought at 78 or less, it would seem his plain duty to vote to make the government protect the people from this "giant monopoly," and make what he had bought at 78 worth 210 and more, so as to leave a profit of \$13,200 on the little investment of \$1,000, and in proportion for larger investments. In this way it will be able to create an irresistible "public opinion" in favor of a United States railroad system, which would meet singularly little resistance from the owners of the railroads to be bought. Now is a good time for the government to buy—in the opinion of some stockholders who have found the market falling under them and can in no way get it up; but the basis of purchase will have to be modified if it is to be at all acceptable to holders of Wabash, Iron Mountain, Texas & Pacific, Erie, New York & New England, Ohio & Mississippi, Mobile & Ohio and perhaps one or two hundred other stocks, whose price, if equal to 25 times their average dividends for the past five years, would be zero, or painfully near it. To such stocks, it should be said, the Prussian law of 1838 does not apply.

If ever the question of state purchases does come up in this country we see that it is by no means certain that it will be opposed by stockholders, and that there is plenty of room for it to become very "interesting" to legislators.

The telegraphs seem much more likely than the railroads to become a state institution in our day, and a great deal could be said in favor of giving government \$3 dollar for dollar for Western Union stock, which pays 7 per cent. and reports a considerable surplus in addition. A very great profit might be made on the purchase by the government, advocates of the purchase might say, and that it would certainly be close enough dealing with the Western Union stockholders to make them accept 3 per cent. instead of 7. Notwithstanding which these stockholders would probably offer very little resistance, and accept the reduction of their incomes with cheerfulness and resignation; and, possibly, some of those cognizant of the negotiations would be caught "long" of the stock when the contract was completed, and close out at 100 what they paid 75 for.

The number of furnaces in blast Jan. 1 last is reported by the *Bulletin* of the American Iron and Steel Association to have been 307, against 334 July 1, and 417 Jan. 1, 1883. Within a year, therefore, the number of furnaces producing pig-iron was reduced more than one-fourth, but three-fourths of the reduction was made in the first half of the year.

Of the total reduction of 110 of the number in blast, 43 were anthracite and 45 charcoal furnaces, and only 22 were furnaces using bituminous coal or coke, though the total number of the latter lacks but one of being as great as the number of anthracite furnaces. The percentage of decrease was 26½ per cent. in the number of anthracite furnaces in blast, 35 per cent. in charcoal, and 17½ per cent. in bituminous furnaces. The charcoal furnaces are much smaller on the average than the others.

During the year 12 new furnaces were completed and 17 were abandoned. At the close of the year, notwithstanding the unfavorable outlook, 19 new furnaces were going up; at the close of 1882 the number was 27, however.

There were 683 furnaces completed in the United States at the end of the year, of which 307 were in blast and 376 (55 per cent.) out of blast. Only 35 per cent. of the charcoal furnaces were in blast, 53 per cent. of the anthracite and 47 per cent. of the coke furnaces.

The *Iron Age* has gathered statistics of blast furnaces which are particularly important because they give the capacity of the furnaces in and out of blast, which has never been done before. This capacity of furnaces in blast it reports to have been 83,125 tons per week Jan. 1 last, against 106,184 the year before, so that the decrease in production was probably 27½ per cent., while the decrease in the number of furnaces in blast by its report (which differs materially from that of Mr. Swank, of the Iron and Steel Association), was 33 per cent., showing that generally it is the smaller furnaces that are out of blast. But this is not true of all classes of furnaces. The average capacity of the furnaces in blast Jan. 1 in 1884 and 1883 was as follows, according to this report, in tons:

	Charcoal.	Anthracite.	Bituminous
1884.....	115	264	449
1883.....	111½	233	385

Thus though the average capacity of each class is larger this year than last, the difference is trifling in charcoal furnaces; it is 13½ per cent. in anthracite furnaces, and in bituminous, or, more properly, coke furnaces, the increase in average capacity is very large, amounting to 16½ per cent. The average capacity of the coke furnaces is 70 per cent. greater than that of the anthracite furnaces, and though there is a larger number of the latter in blast, their aggregate capacity is but 28,834 tons, against 45,365 of the coke furnaces. The charcoal furnaces have but about one-fourth the capacity of the bituminous furnaces, so that a great decrease in these has comparatively a small effect on the quantity of pig iron produced.

The Portland & Ogdensburg Railroad, which was originally intended to be a trunk line, to do for Portland something like what the Boston & Albany did for Boston, secures

but a very light traffic, and probably scarcely any trunk line traffic. During the year ending with September last its traffic was at the rate of 50 passengers and 97½ tons of freight each way daily over the whole length of the road, and yet the freight traffic was nearly a sixth greater than the year before. The net earnings of the 94 miles of road owned, which has a funded debt of \$3,068,000, were \$49,720 last year and \$106,304 the year before. In connection with other roads the Portland & Ogdensburg makes a short route from Portland to Ogdensburg (365 miles), and Ogdensburg is reached by lake vessels from the West. If Ogdensburg were equivalent to Buffalo the Portland & Ogdensburg scheme would have been a promising one; it makes Portland nearer than New York to lake navigation. But there are different kinds of lake navigation, and the kind which is practicable as far down as Ogdensburg has been found so much less economical than the kind practicable between Buffalo and the upper lakes that the Ogdensburg line of propellers has been abandoned. The large vessels that went to Buffalo could not get through the Welland Canal, and the small vessels could not compete with the large ones.

The enlargement of the Welland Canal should, it would appear, be of great advantage to Ogdensburg; but so far it seems not to have been. In fact, when produce gets so far down the St. Lawrence it is within 115 miles of Montreal and sea-going vessels, and when navigation is open it must be much cheaper to send it this way than 345 miles by rail to Portland. In winter produce does not go to Ogdensburg to any extent, and what the Grand Trunk carries east on the other side of the Atlantic it of course hauls over its own road to Portland, though the distance from Ogdensburg by it is 409 miles.

Mr James F. Joy has been appointed by the Delaware Lackawanna & Western as an arbitrator to sit with Mr Charles Francis Adams, Jr., and a third person to be selected by them both, and decide the percentage of the west-bound freight from New York city which this road shall have.

Mr Joy should possess special qualifications for such a task, having had a very long and wide railroad experience as President for many years of the Michigan Central, the Chicago, Burlington & Quincy, and other roads, and being a man of very unusual ability, well known to railroad men all over the country, and commanding their respect. His association with the Lackawanna people has not been particularly close, we believe; but Mr Sloan succeeded him as President of the Michigan Central, and Mr Joy is a co-director with Mr Sloan and three other directors of the Lackawanna Company in the Wabash board.

It would hardly be supposed that the opening of the Canadian Pacific Railway in Manitoba, some 2,000 miles from New York, would increase the supply of fish at New York, one of the best fish markets in the country; but so it is. Tons of pickerel are taken in winter from a very deep lake that empties into Lake Winnipeg, some distance north of the line of the Canadian Pacific, being driven there, apparently, from the colder waters of shallower lakes and streams. The temperature of 50 degrees below zero or thereabouts that prevails there puts them into fine shipping condition about as soon as they get out of the water, and they go where there are people to eat them. We may have fresh musk ox yet and reindeer venison.

A chief engineer asks to be informed through the *Railroad Gazette* of the best station signal—the most reliable signal for agents to stop trains with.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads in 1884 as follows:

Gettysburg & Harrisburg.—Extended southward to Gettysburg, Pa., 6 miles.

Union Pacific.—Track on the *Beatrice Extension* is completed by laying about 19 miles, from Courtland, Neb., to Beatrice.

Vicksburg, Shreveport & Pacific.—Extended from Ruston, La., west to Arcadia, 27 miles.

This is a total of 52 miles of new railroad, making 93 miles reported to date for 1884. The total track reported laid to the corresponding date for 12 years is as follows:

Miles.	Miles.	Miles.
1884..... 93	1878..... 84	
1883..... 79	1877..... 42	
1882..... 192	1876..... 70	
1881..... 110	1875..... 62	
1880..... 176	1874..... 32	
1879..... 70	1873..... 210	

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

The amount of new railroad completed in the early weeks of the year depends very much upon the weather, and thus far it has been very unfavorable for track-laying, except in the far South.

Railroad Policy in England.

I. ENGLISH RAILROAD TRAFFIC.

The general questions at issue between railroads and investigating committees in England are almost exactly the same as here. But the details are far from being the same. The character of the business is different; the established usages are different; the whole history of the relation of railroads to their patrons and to the government is different.

The illustrations which are drawn from the English sys-

tem and the attempts to apply them to American conditions are apt to be misleading. Sometimes the facts are wrongly stated. This is especially the case in matters of history. There has grown up in this country a set of traditions about the early history of the English railways which might have been the work of Ananias himself. Yet these traditions appear in almost every popular magazine article or address, and too often find their way into the minds of a legislative committee. More commonly, however, the individual facts may be stated correctly enough and yet leave a mistaken impression, unless we take them in connection with other facts, past and present. Almost all attempts at direct comparison of rates and services are of this character. They are likely to be worse than useless, unless we have a general knowledge of the conditions which govern them.

It is the aim of these papers to furnish a general view of those conditions as far as is possible within a narrow compass; to examine into the character of the traffic, the prevalence of competition or combination, and the various attempts at government control; and to show their effects in the railroad business of England to-day.

Comparing the statistics of the English railways for 1880 with the figures of the United States census for the same year, we find some of the more important facts as follows:

	Great Britain and Ireland.	United States.
Mileage.....	17,853	87,891
Permanent investment.....	\$5,544,475 000	\$5,182,446 000
Cost per mile.....	306,414 000	59,718
Gross transportation earnings.....	17,036	6,604
Per mile.....	163,526 000	352,800 000
Transportation expenses.....	53 3	60 8
Per cent. of earnings.....	142,888 000	227,050 000
Net transportation earnings.....	7,698	2,595
Per mile.....	4.7 p.c.	2.70 p.c.
Dividend average.....		

The United Kingdom possesses about one mile of railroad to 6.8 square miles of territory; essentially the same proportion as in the states of Pennsylvania, Ohio, Indiana, or Illinois. But if England alone be considered, apart from Scotland and Ireland, the proportion is of course much greater—nearly the same as in Massachusetts.

The cost per mile in England has been more than three times that in America. The gross receipts per mile are not much more than two and a half times as great. Owing to their more favorable ratio between earnings and operating expenses, the English net earnings per mile are three times as great as the American. The proportion of net earnings to capital is thus about the same. But the English companies are able to pay a much higher dividend than the American, owing to their freedom from heavy fixed interest charges; for the issue of railroad bonds in England has been rigidly limited to one-third of the paid-up capital.

By a curious coincidence the amount of capital invested in railroads in England and the United States is almost exactly proportional to the population.

While it is tolerably easy to compare the extent and financial condition of the two systems, it is almost impossible to compare the amount of work done, or the cost of doing a given amount of work. The English railways do not furnish or even compile ton-mileage statistics. Train mile figures we have in abundance. We know that their average train-mile expense (1880) is 66 cents; that their receipts per passenger train-mile average \$1.10, per freight train-mile \$1.52; but as long as we do not know the average weight of freight or number of passengers carried, we cannot even guess at what these figures indicate.

Nor will a direct comparison of rates serve our purposes better. The kind of service obtained for a given charge is entirely different. The English passenger traffic is essentially a short-distance traffic. The goods traffic, in the higher classes at any rate, corresponds rather to our express than to our freight service in what the railway company undertakes to do. If we see English rates cited, we must inquire what is demanded of the railway in return for that payment before we can make any comparisons with similar rates in America.

The English freight service is to be classed with our express on account of its great promptitude, and on account of the fact that in so many cases it undertakes the work of collection and delivery. This promptitude is, of course, only possible on lines of regular traffic; that is to say, in general between cities of considerable size; but here it is carried to a high state of perfection. Goods received by the railway companies at Liverpool in the afternoon, and destined for London, are forwarded the same night and delivered at the door of the consignee on the morning following. Nor is this an exceptional case. The force employed by the railway companies for cartage is enormous; its organization, for collection as well as for delivery, is thorough; and the terminal expenses due to this work form a main item in the freight charges of the higher classes of goods.

In the "Clearing-House classification," now generally adopted by the English railways, the first main division is into "carted" and "not-carted" goods. The charges on the former include collection and delivery. Those on the latter do not. The not-carted goods are further subdivided into "mineral" and "special" classes; the former including coal, rough stone, ores, manure, etc.; the latter including grain, lumber, unmanufactured metal, etc. The carted goods are divided into five classes, numbered in the reverse order from our own; that is to say, the least valuable goods are placed in Class I, the most valuable in Class V. It is of course impossible to make a direct comparison between these classes and any system of classification in America. It can only be said that there is a general tendency to class articles low in England; that a large proportion of the goods in Class IV., or even in Class III., would be likely to count as first-class freight in this country, while the articles

in Class V. would generally be sent by express under our system.

The first column of the following table shows the percentage of traffic under each class on the Great Western lines for the year 1880. The balance of about one per cent. not accounted for is chiefly chargeable to empties. The Great Western runs through such a variety of country—manufacturing, mining, and agricultural—that its figures may fairly be taken as representing the general conditions of England and Wales:

	Percentage L. & N. W. rates, 96 miles. G. W. traffic, s. and d., per ton. cls. pr. 100.
Not carted.....	Mineral..... 58.30
	Special..... 23.60
	I..... 7.60
	II..... 4.03
	III..... 2.55
	IV..... 1.17
	V..... 0.44
Carted.....	Mineral..... 13a. 4d.
	Special..... 22a. 6d.
	I..... 30c. 8d.
	II..... 35a. 0d.
	III..... 40a. 0d.
	IV..... 55a. 0d.
	V..... 60

The local schedule rates, taken as an example in the table, are from Nuneaton to London. Nuneaton is on the main line of the London & Northwestern, half-way between London and Liverpool. It is a junction of some slight importance, but not really a competitive point. The schedules from better known places are so complicated with special rates as to be almost useless for illustration.

A large part of the mineral traffic is done in cars belonging to the shippers—"private wagons," as they are technically termed. In the early railroad charters it was supposed that such ownership would be the rule; but it never prevailed in the case of carted goods to any considerable extent. Ever since 1845 there has been a certain amount of effort to do away with it in the mineral traffic, but without any great success. Only on the Northeastern lines, where there is little chance of competition from other railway companies, have private wagons become an exception. There seems to be no good reason why they are retained elsewhere. The owners complain of damage and detention; the railways complain of waste of space and power. Both parties seem to have good ground for their complaints. At any rate, the existence of private wagons is a source of trouble and expense to the railways, besides giving their trains such an utterly disreputable appearance that the uninstructed observer might suppose the companies to be on the verge of bankruptcy. Yet the practice still goes on with but slight abatement, and seems likely to go on as long as conservatism is the ruling passion in the breast of the average Englishman.

The passenger traffic in its three classes is conducted at prevailing rates of four, three and two cents per mile respectively. Practically, the bulk of the traffic is done at a two-cent rate. The change in this respect in the last fifteen years is quite noticeable. Fifteen years ago the fast trains did not generally carry third-class passengers; now they almost always do. At the same time the comfort of the third-class carriages has been greatly increased. The result has been an enormous development of third-class travel. Comparing the figures of 1880 with those of 1870, we find that the number of third-class passengers carried had much more than doubled, while the first-class had increased but slightly, and the second had diminished considerably. In the year 1880, out of the immense total of 541 millions passengers carried (more than double the American figures for the same year), five-sixths were third-class; so that the third-class traffic produced more than twice the gross revenue of the two other classes combined. There is therefore but slight error in regarding two cents per mile as the normal passenger rate in England.

If we compare the prevailing rates of fare with the gross earnings of each class, we reach the conclusion that the number of passengers carried one mile in England was a little over four thousand millions, or about two-thirds of that in America; so that the average length of a passenger journey in England is less than one-third what it is with us. If we could make allowance for double counting in the returns, it would probably increase this difference.

Several causes may be found for this. The passenger traffic in London itself amounts in round numbers to a hundred millions annually. The suburban traffic of London and other cities might readily furnish twice as many more. All this makes a direct comparison of passenger fares in the two countries quite useless for any practical purpose.

ARTHUR T. HADLEY.

NEW PUBLICATIONS.

Notes on Mechanical Engineering. By Henry Adams, M.I.M.E., M.I.C.E., etc. Published by E. & F. N. Spon, London and New York.

This unpretending publication contains a large amount of useful information in a small compass, and should be valuable to both students and engineers as an aid to memory, containing as it does, numerous facts and figures on various branches of mechanical engineering. The fundamental principles of mechanics, the properties of the principal materials used in the construction of mechanical appliances, and the behavior of materials under strain are among the general subjects treated. Some useful memoranda are given as to riveting and caulking, but the figures for the speed of cutting tools, especially for wood-working, require a little further elucidation. The limits given, 300 ft. to 8,000 ft. per minute, are somewhat wide, and would hardly be of much practical use to a student. The number of cuts to the inch for iron-working tools is given at from 16 to 80 to the inch. This seems altogether too fine, at least for a railroad or piece-work shop, where from 3¼ to 12 to the inch is found to give excellent results with suitable tools.

The notes on hydraulic machinery are especially valuable,

as the author has had considerable practical experience in this branch of the profession.

It is a matter of regret that this book is so short, and that consequently some of the subjects are treated in quite a fragmentary manner. We trust the author will remedy this defect in a future edition, as the book would well bear considerable expansion.

The Tabor Steam Engine Indicator. By Geo. H. Barrus, S. B., M. Amer. S. M. E.; published by the Ashcroft Manufacturing Co., New York.

The shape and small size of this book render it convenient to carry in the pocket, and with the concise and well-arranged contents combine to make it a very useful companion to any one wishing to take indicator diagrams and test the working and consumption of a locomotive or stationary engine.

Reproductions of several indicator diagrams are given, some of which show the unequal distribution of steam possible on a locomotive when the valves are set by the sound of the exhaust only. An indicator, when properly fixed, enables the exact action of the steam in the cylinders to be accurately determined, while valves evenly set in the shop when the engine is cold may prove to give a very different result when the engine is under steam, and the eccentric rods, spindles, joints, etc., are alternately stretched and compressed with the work of driving the valves. The diagrams in question prove, moreover, that the ear is not a sufficiently trustworthy guide in setting valve gear.

Some comparisons are drawn between the performances of the Richards, Thompson, and Tabor indicators, and numerous specimens of diagrams from these different varieties of indicators are given. Those who have used the first-named will certainly be disposed to consider that better diagrams than those shown can be produced at considerably higher speeds, when the steam is moderately dry and the indicator in fair order. Specimens of diagrams from Tabor's indicator at speeds of 600 revolutions per minute are given, which are sufficiently free from undulations and other irregularities to be useful.

The Mechanics of Engineering and of Machinery. By Dr. Julius Weisbach. Vol. III, revised and enlarged by Gustav Hermann, and translated by J. F. Kline, D. E., Professor of Mechanical Engineering, Lehigh University. Published by John Wiley & Sons, New York.

This is a very complete and elaborate treatise, dealing very thoroughly with the various details of prime-movers, and machinery generally. It is well and profusely illustrated, and is likely to be useful to all those who have a familiar acquaintance with higher mathematics and find it more convenient to reason in algebraical symbols than in words.

The strains, flexure and construction of axles and shafting, and the design of bearings, couplings, etc., are fully treated, while the properties of differential, non-circular, bevel, skew bevel and other varieties of wheels are investigated. The properties of belts, ropes and wheel gearing of various sorts are illustrated and described, mathematical formulae being given by which these various methods of transmitting force can be correctly proportioned.

A considerable portion of the book is devoted to a description and analysis of various forms of link work and parallel motion, and a long introductory chapter treats the subject of kinematics pretty fully.

Report of Proceedings at Sixteenth Annual Convention of the American Railway Master Mechanics' Association, held at Chicago, June, 1883.

This is a somewhat larger volume than any of its predecessors, and bears testimony to the greater popularity of the Master Mechanics' Association and the increasing interest taken by the members in the preparation of papers on mechanical subjects. It appears from the report that 89 members of the Association were present at the convention, and that 62 new members joined the Association, which now numbers in all 241 members, of whom 15 are associate and three honorary members.

The papers read before the convention are numerous and well illustrated, though in many cases but little discussion took place. This cannot, however, be said of a paper by Mr. F. W. Dean on "Improvements in Locomotives," which was somewhat sharply criticised. Some of Mr. Dean's suggestions doubtless possessed elements of value, but practical experience is able to see rocks ahead which escape the notice of younger and more sanguine men. Mr. Dean's views as regards the improved economy in the use of coal possible on locomotives deserve attention and were supported by one at least of the master mechanics present.

The committee appointed at the previous convention presented an interesting report on "The Best System of Paying Premiums to Engineers and Firemen to Induce Economy in Fuel." That recommended by the committee is based upon the individual work of each crew or engine, compared with an average made for the same work done for a previous period of time. An accurate record should be kept for each engine, showing the amount of coal consumed, the miles run, and the average train. From these figures are deduced the quantity of coal burnt in performing a given amount of work, say, in hauling a car one mile. A given figure, say, for example, 4 lbs. per car mile, is taken as a standard, and half the value of any coal saved on this amount is divided between the engineer and fireman. This is, briefly, the system that has been used for some time with great success upon one of our main trunk lines. Important savings can doubtless be accomplished by such a system, if carefully worked out, with attention paid to detail. It certainly seems preferable to the plan whereby on a division the crew burning least coal obtain the only premium. One skilful crew with a good engine can under favorable circumstances make sure of getting the premium month after month, and other crews

giving up the race as hopeless have no incentive to exertion in the direction of economizing. With the plan recommended by the committee, every crew stands a chance of getting some premium, the amount of which depends partly upon their own skill, partly on the weather and the condition of their engine, and to a great extent upon the relation of the fixed amount per car mile to the nature of the work the engine is called on to perform. For instance, if the trains are exceptionally light or exceptionally heavy the consumption per car mile will be increased, and any saving will be difficult, while service on a heavy division will compare unfavorably with service on a light division. As engines stationed at the same round-house may be engaged in widely differing services, where the consumption must vary, owing to gradients, curves, etc., it is somewhat difficult to arrange the running of the engines so that each crew shall have a fair and equal chance. But there can be no doubt that an immense economy can be effected by even an imperfect system of premiums for coal-saving, and any inequalities can be redressed by a little patience and attention to details. The individual crews will soon remonstrate should they feel that they have not a fair chance of earning as big a premium as their neighbors. Matters can then be put right, and as the report observes, "if at times trains run irregularly, it is found that in three months all have come around all right, and all have had equal show at the easy and hard circumstances." It is recommended that the coal be measured by bulk, not by weight, so as to avoid inaccuracies from loss of weight by exposure to the weather, and increase of weight by moisture. The number of cars is ascertained from a blank filled up by the conductor, in which are specified the number of empty and loaded cars left and taken on at each station. Specimens of the necessary special blanks to be filled up by the engineers, conductors, station agents, etc., are given in the report, which is remarkably complete, and is worthy of careful attention, as it is no mere idea, but is founded on actual and successful practice on a large scale.

The report of the committee on "Improvements in Locomotive Boilers," is illustrated with drawings of ten boilers in use on different types of locomotives on the West Shore, Pennsylvania, Lake Shore, Rock Island, Central of New Jersey, Philadelphia & Reading, and Louisville & Nashville railroads. Mr. C. A. Smith also contributes a drawing of a proposed oval boiler, by which a larger amount of heating surface can be obtained. The committee invited the co-operation of English locomotive superintendents, several of whom responded, and forwarded in all drawings of five boilers in use on various classes of main-line engines. There are thus altogether drawings of sixteen different locomotive boilers, and in a majority of cases the details of the methods of staying the crown sheets, making the seams, etc., are given, showing the pitch of riveting, etc. Drawings of most of these boilers have already appeared in the pages of the *Railroad Gazette*.

The report of the committee simply calls attention to the leading peculiarities of each boiler, and does not enter into any details as to the relative merits of different methods of construction. The drawings, however, contain much interesting and useful information, which it may be presumed that members will digest at their leisure, and come prepared at the next convention to seek further information, and more fully discuss the requisites for a good boiler.

A very elaborate report from the Committee on Spark Arresters follows, and is illustrated by numerous cuts of manifold devices patented and used during the last fifty years for the prevention of sparks. The report appropriately commences by a reference to a contrivance invented very early in the morning of railroad construction which actually did prevent sparks. Unfortunately the details of this admirable contrivance are not recorded in any history which we at present possess, and consequently a large number of engineers and inventors have been more or less vainly endeavoring to rediscover this lost secret ever since. Possibly the cure was of the nature recommended by a physician long since departed. A patient came to him and said she had a pain whenever she held her hand above her head. "Then don't hold up your hand, madam," was the gruff but common sense prescription.

And similarly it may be possible that this early inventor, who, incredible as it may appear, actually lived before the days of car-couplers, had the boldness and originality to imagine that the best use for sparks was never to make them. Like most simple remedies, it seems difficult of application, but it certainly does seem that if it were possible to convert the coal in a fire-box wholly into gas and ashes, burn the former in the fire-box and drop the ashes in the ash-pan, the evaporative power of most kinds of coal would be immensely increased, and the cost and wear and tear of spark-arresting devices saved.

The extended smoke-box is the subject of the next report, which is strongly in its favor when combined with brick arch, high exhaust and straight stack. The saving in fuel is stated to be 20 per cent. on some lines, while the amount paid as compensation for fires caused by sparks is either greatly diminished or is wiped out altogether.

The remainder of the book is chiefly occupied by a long and exhaustive lecture on the subject of color-blindness by Dr. B. Joy Jeffries, of Boston, who has devoted much time and attention to the matter and strongly advocates the use of Holmgren's test for discovering defective vision in railroad employes. Short papers on the subjects of Check Valves, Standard Reamers, Metallic Packing for piston rods and valve stems, and a new rig for indicators follow. Memoirs of deceased members, J. E. Martin, Howard Fry and Samuel J. Hayes, conclude a very interesting and instructive volume.

Foreign Railroad Notes.

The Nuremberg & Fürth Railroad, one of the oldest (and shortest) in Germany, paid a dividend of 21 per cent. in 1883, as it has done heretofore for a number of years.

Recently railroad lines began to carry grain in bulk from Russia to Germany, and now the roads forming a line between Roumania and Germany are preparing to do so—something novel in Europe. One of the reasons given by Roumanian shippers for asking it was that new Indian corn, on account of dampness, is apt to be injured if shipped in sacks, and suffers less when in bulk.

In a German railroad paper we find an advertisement offering willows to be planted for snow fences. The advertisement says that they are used for that purpose now, chiefly in England (h), that they serve the purpose perfectly, and moreover make a yearly return of something more than 3 cents per yard of fence. It says "blood" (red f) willows are best, and it offers them at the very moderate price of \$2 per 1,000 or \$18.75 per 10,000, so that it can hardly be very costly to try the experiment. The protection is needed here much more than in Germany, and there are some thousands of miles of roads on the prairies where it is probably not too dry to grow willows.

German papers publish a statement of the number of cars and locomotives lighted by gas on the Pintsch system. At the end of 1879 but 5,000 cars and 43 locomotives were so lit; now the list enumerates 13,188 cars equipped for burning the gas and 442 locomotives. Five of the locomotives are in Holland, and all the rest in Germany. The number of cars equipped in different countries is given as follows:

Germany.....	8,871	Russia.....	461
England.....	1,759	Sweden.....	72
France.....	643	Switzerland.....	204
Holland.....	538	United States.....	211
Austria.....	338	Italy.....	21

The following American roads are credited with the following numbers of cars lit by Pintsch gas: Erie, 101; West Shore, 80; New York, Providence & Boston, 5; Chicago & Atlantic, 25; besides 22 more ordered for the latter, but not yet equipped.

Sir Edward Watkin, at a meeting of the Railway Shareholders' Association, formed to oppose legislation hostile to the railroads, contended that competition had given and would give better results than any government control, and gave the following as the effect on traffic between Manchester and London since 1857, before a second line was open:

	1857.	1884.
No. passenger trains daily.....	17	60
No. trains carrying third-class passengers.....	3	60
Time of third-class trains.....	11 h.	5 h. 25 m.
Maximum time of other trains.....	10 h. 45 m.	5 h. 50 m.
Minimum time of trains.....	5 h. 25 m.	4 h. 30 m.
First-class fare.....	35s.	24s. 6d.
Second-class fare.....	25s.	20s.

The third-class fare has been reduced a few pence. The distance from London to Manchester is 189 miles, the first-class fare now \$5.95, and the second-class \$4.87.

It is remarkable that in the discussions on the subject which are frequent now in England, rarely is anything said of freight charges and their course.

In Bavaria a few years ago a fast freight service was established, not by running freight trains fast, but by carrying the goods shipped as fast freight on the first train that went after receiving them, avoiding delays en route, and giving notice to the consignee as soon as they arrived. It is simply favored freight. If the train that first passes cannot take all the freight waiting at the forwarding station the other freight waits till the fast freight is taken; should anything make it necessary to side-track some cars en route care is taken that these cars have no fast freight. For this the shipper pays one-fifth more than the rate on ordinary freight. The service has been so popular that the railroads of Alsace-Lorraine (owned by the German Empire) have just introduced it. It will be seen that what is done to hasten this freight delays so much the more the other freight. There seems to be no change whatever in the average time freight is on the road, but those who pay the extra 20 per cent. for speed secure that the delays shall all fall on the other freight.

The Brenner Railroad first united Germany and Italy. Before it was opened there was almost no direct interchange of freight by land between the two countries, in the year before (1866) only 216 tons going from Germany to Italy and 16½ from Italy to Germany. The year of the opening about 2,500 tons went in both directions, and the next year 6,882 tons went from Germany and 6,403 to it, and the interchange increased rapidly until the German exports culminated in 1875, when they were 40,210 tons, and the Italian exports to Germany were 66,600. The Italian exports have grown since, and were 88,445 tons in 1880 and but little less in 1881; the German exports were but 27,329 tons in 1881, but they averaged 30,590 tons for the six years ending with 1881. Now the Gotthard Railroad affords another direct route from Germany to Italy and is doing a considerable business. The tonnage given above, however, we should hardly consider a heavy traffic in this country, the greatest movement being at the rate of only 286 tons per day in one direction and 216 in the other. But these statistics are before the time of the opening of the Gotthard road, which is carrying to Italy coal and iron from the Rhenish provinces, gas coal, and timber from the Black Forest and the Vosges, barley, spirits and sugar, and bringing thence to Germany vegetables, fruit, wine, poultry, cattle etc. Still, it is said that the Germans do not succeed as they hoped in Italy against the competition of the French and English.

TECHNICAL.

Old Freight Cars.

Here and there on some of the old lines of railroad can be found a few specimens of ancient car construction that present some interesting features when contrasted with modern methods. Some old freight cars of the ordinary box pattern, originally built for the Camden & Amboy road, have been in service nearly twenty years. The bodies are 27½ ft. long, and perfectly straight, although there is no longitudinal trussing. The only trusses are two ¾-in. rods running crosswise over the transoms, the stiffness of the bodies being dependent mainly upon the floor timbers, which are of yellow pine and oak. The side sills are 4½ x 8, the centre sills 4 x 8, and the two intermediates 3½ x 8 in. The transoms are 5 x 14. Two crosspieces, four ft. apart, are bolted to the floor timbers underneath, and near the centre. The pillars are bolted to the sills and plates. There are no mortises or tenons. The outside sheathing is ½ in. thick, and the roof is supported by oak carlines 2 x 2 in., placed 18 in. apart. The average weight of the cars is about 18,000 lbs. We have no means of ascertaining the maximum weight of loads carried. It is claimed that the bodies of these cars are lighter, cheaper and more serviceable than many of the so-called improved modern styles of construction; and special attention is called to the fact that the bodies have kept straight all this time without the aid of truss-rods. The timber was, of course, sound and well selected, free from shakes and sap.—*National Car-Builder.*

The Construction of Light Passenger Coaches. The following is a résumé of an interesting communication, signed "M. C. B.," which appears in the *National Car-Builder*:

A passenger car seating 76 passengers, having 42-in. wheels and a body 57 ft. long can be built to weigh only 40,000 lbs. The paper wheels will weigh about 1,000 lbs. each, and the two 4-wheel trucks will be about 5,000 lbs. heavier than similar trucks with 33-in. iron wheels. The weight of the car body, therefore, should not exceed 29,500 lbs. To build such a car strong enough to stand the wear and tear without requiring more repairs than an ordinary car requires deviations from the usual style of workmanship. The light small stuff commonly used in joints and fittings will not answer, as it lacks strength. Most builders distrust any reduction in the sizes of timbers in car framing, the joints and connections as usually made being already too weak. When a carline is cut down to ¾ in. and is made of two pieces, or when a post is reduced to ¾ in. the screws must not be driven with a hammer. A workman upon light cars must learn how to drive a nail, and must know when to stop using his hammer. The need of this will be manifest to any one who examines a piece of passenger car framing. A dozen places will be found where the joints are crippled by hammer-blows struck without reason. This, in the common work, is not serious, but is ruinous in good and light work, where small pieces are used.

The importance of gluing in car work is generally conceded, but it is seldom well done. Many builders do not take the trouble to find out what brand of glue is best adapted to the work, and consequently miss the advantages derived from the use of a good article. One kind, which partakes of the quality of fish glue, is of great value in car work, as it is stronger and more fluid and adhesive than the common kinds, and only costs five or six cents a pound more. This glue applied to the end of the grain, will hold so firmly that a 30-in. stick, an inch square, with glued joint in the centre, cannot be broken with the hands. Common glue carelessly made, often remelted and used when half chilled, is useless. To derive the greatest benefit from the use of glue suitable clamps must be provided for the different parts of the work, and the pots must be kept hot all the time. If canvas is put on the panels and turned up on the posts the job is very nearly perfect; but the difficulty is to get the glue thoroughly rubbed into the corners. The whole inside of the panel should be covered with canvas which is then glued to the posts and secured by both brads and screws.

The "ship-splice" is another feature in construction that suffers from poor workmanship. Not long since I found a useless ship-splice in a top plate, the screws were driven so hard as to split the plate at each end of the splice, thus making a weak place where strength is very essential. Both key and screws should be driven just enough and no more.

In regard to the thickness of outside paneling opinions differ. Formerly about ¼ of an inch in thickness was thought about right. Now, however, ½ in. panels are found fully strong enough if well canvased on the inside. Thinner panels have been used and done good service, but the canvas was turned up on the posts and well glued into the corners, and the glue was kept very hot. My own opinion is that ½ in. should be the minimum thickness, when the canvas is not turned up on the posts and attention given to the corners and glue, as above stated.

[In English cars, ¾-in. panels of teak are used uncavased. Cavased mahogany panels ½ in. thick were much used 20 years ago and have stood well. In France and Germany thin sheet-iron panels are almost universally used.]

A great deal of unnecessary work is expended upon passenger car roofs. Generally speaking the whole wood framing of the sides of the clear-story or raised roof is so much superfluous lumber that the short carlines have to carry. In many of these roofs the carlines are so much curved that their strength is only that of the wood with the grain running diagonally or crosswise, and consequently the roof construction cannot be lightened without weakening it. The furring, as usually put in, is practically useless. This is not necessary, as it may be made to contribute to the strength of the roof by designing it as a part of the roof framing and getting it out in advance. It can then be gained into the carlines or posts of the deck, and do good service as an integral part of the structure. In the long run this is the cheapest way, although it necessitates more preparatory work than the common method. If a light and strong car is wanted the blocking must be prepared with as much care as the various parts of the frame. The master car-builder should be the inspector of his own work as respects the dimensions of sticks, and especially blocking, and see that none of it is an encumbrance instead of a help to the strength and stability of the structure.

Light passenger cars are a paying investment, and the extra labor and care required in the building of them is well spent. Such cars stand heavy traffic well, require no larger outlay for repairs, and suffer no more in the general run of accidents than heavier cars.

Central Pacific Wages.

The Central Pacific Railroad Co. has furnished the Bureau of Labor Statistics with a list of its employees, their occupation and compensation, as follows: Total number, 9,986 persons, comprising 438 clerks with salaries ranging from \$50 to \$200 a month; 225 agents from \$50 to \$225; 221 conductors from \$85 to \$115; 18 porters from \$40 to \$90; 4 messengers from \$20 to \$35; 740 station laborers from \$60 to \$95; 704 brake and flagmen from \$65 to \$80; 3,452 laborers from \$35 to \$90, 3,388 receiving not more than \$55; 60 pumpers from \$65 to \$85; 195 patrolmen from \$41

to \$55; 845 mechanics at \$52 to \$84; 143 engine wipers at \$60.90; cleaners at \$80; 287 stamer hands from \$60 to \$175; 19 in ship-yards from \$84 to \$104; 304 engineers from \$85 to \$145; 388 firemen from \$65 to \$80; 12 draughtsmen from \$75 to \$200; 570 mechanics from \$60 to \$85; and 50 watchmen from \$55 to \$60.

Quite a number of these employees receive higher wages than are paid on most Eastern roads.

Strong Cast-Iron.

Some tests recently made by the Thomas Iron Co. of samples of Muirkirk charcoal pig-iron gave unusually high results. The pig from which the test pieces were taken was first cut into four parts by a shaping machine, two of the parts being afterward turned down to exactly ½ in. diameter. The two pieces were then tested and stood a strain of 12,580 and 13,040 lbs., which was equivalent to 50,320 and 52,160 lbs. per square inch respectively.—*Iron Age.*

Electric Railroads for London.

The London Central Electric Railway seek for powers to construct a railway commencing by a junction with the authorized Charing Cross & Waterloo Electric Railway, at its terminus in Northumberland avenue, proceeding to Piccadilly Circus, and from thence passing under the new street now in course of formation to New Oxford street, and by way of Holborn to Newgate street and the General Post office, St. Martin's-le-Grand. The line for its entire length will be in a tunnel 10 ft. high. The proposed railway would be a great boon to Londoners generally; and if electricity can be relied on as a motor, the tunnel would be free from mephitic vapors, which tend so much to destroy the comfort of those using the underground railways as at present worked by steam. Another scheme is that of the Mid-London Electric Railway, who seek for powers to construct an underground railway from the west end of Oxford street, close to the Marble Arch, to the Royal Exchange, passing under and along Oxford street, New Oxford street, Holborn, Newgate street, Cheapside, and Cornhill. Both lines propose to pass through the main thoroughfare of London, corresponding to Broadway in New York.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Boston & Albany, annual meeting, at the Meionan in Boston, at 10 a. m. on Feb. 11.

Delaware, Lackawanna & Western, annual meeting, at the office in New York, Feb. 26, at 10 a. m. Transfer books close Feb. 6.

Florida Southern, annual meeting, in Palatka, Fla., Feb. 29, at noon.

Missouri Pacific, annual meeting, at the office in St. Louis, March 11, at 9 a. m. Transfer books close Feb. 9.

St. Louis & San Francisco, annual meeting, at the office in St. Louis, March 11. Transfer books close Feb. 9.

Union Pacific, annual meeting, at the company's office in the Equitable Building in Boston, March 5, at 10 a. m. Transfer books close Feb. 19.

Wabash, St. Louis & Pacific, annual meeting, at the office in St. Louis, March 11. A special meeting will also be held at the same place March 22. Transfer books will be closed from Feb. 9 to March 24.

Dividends.

Dividends have been declared as follows:

Central of New Jersey (leased to Philadelphia & Reading), 1½ per cent., quarterly, payable March 1. Transfer books close Feb. 9.

Chicago & Alton, 4 per cent., semi-annual, payable March 1. Transfer books close Feb. 15.

Cleveland & Pittsburgh, 1½ per cent., quarterly, payable March 1. Transfer books close Feb. 9.

Detroit, Lansing & Northern, 3½ per cent., semi-annual, on the preferred stock, and 3 per cent., semi-annual, on the common stock, payable Feb. 15, to stockholders of record Feb. 4.

Huntingdon & Broad Top Mountain, 1½ per cent., on the preferred stock, payable Feb. 11, to stockholders of record Feb. 2. This is the first dividend since 1865.

Kansas City, Fort Scott & Gulf, 4 per cent., semi-annual, on the preferred stock, and 3 per cent., semi-annual, on the common stock, both payable Feb. 15, to stockholders of record Feb. 5.

Marquette, Houghton & Ontonagon, 4 per cent., semi-annual, on the preferred stock, payable Feb. 15, to stockholders of record Feb. 5.

New York, Providence & Boston, 2 per cent., quarterly, payable Feb. 11. Transfer books close Feb. 2.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

Western Association of General Passenger & Ticket Agents, annual meeting, at the Burnet House in Cincinnati, Wednesday, Feb. 13, at 11 a. m. Important business is to be brought before the meeting.

American Institute of Mining Engineers, annual meeting, in Cincinnati, beginning Tuesday evening, Feb. 19. Mr. L. E. Warner, Cincinnati, O., is Chairman of the local Committee of Arrangements. A circular will be found below giving the details of the meeting.

Southern Railway & Steamship Association, called general meeting, at the Metropolitan Hotel in Washington, on Tuesday, Feb. 19, at noon.

General Baggage Agents' Association, annual convention, in St. Louis, on Wednesday, Feb. 20.

National Association of General Passenger & Ticket Agents, regular semi-annual meeting, in Cincinnati, O., Tuesday, March 18.

General Time Convention, Spring meeting, at the Grand Hotel in Cincinnati, O., at 11 a. m., on Wednesday, April 9.

Southern Time Convention, Spring meeting, at No. 46 Bond street, New York, at 11 a. m., on Wednesday, April 16.

Railway Car Accountants' Association, annual convention, in Richmond, Va., on Tuesday, May 20.

Engineers' Club of Philadelphia.

The regular monthly meeting of this club was held Jan. 19. Col. Wm. Ludlow, President, in the chair; 20 members and 3 visitors present. After calling the meeting to order, President Ludlow said:

"I deeply regret, gentlemen, that almost my first official duty as your President is to appear as a harbinger of ill tidings, and to announce to you the death of our past President, Mr. Strickland Kneass; a man whom you all knew, and knowing, held in the highest esteem—a typical good citizen and good engineer, faithful in every relation of life, full of industry and conscientiousness, devoted to duty, warm-hearted, clear-headed, capable and honorable."

"A special meeting of the board was held on Thursday, for the consideration of the best method by which our appreciation of Mr. Kneass, and our deep regret at his loss, might

be expressed for transmission to his friends and incorporation into the records of the club.

"It is thought fitting to substitute for the drafting of the ordinary resolutions, which bear, perhaps unavoidably, a somewhat perfunctory character, the preparation of a memorial, containing such a recital of the history of Mr. Kneass as should more effectively set forth his distinguished services and example, both to the profession and the community."

"The special committee to whom this duty is assigned consists of Messrs. Greff, Chairman, DuBarry, Worrall, McClure and Dye, the gentlemen best qualified to discharge it."

Mr. Wilfred Lewis read a paper upon the "Resilience of Steel," reviewing some of the means employed for the storage of energy, and showing the place occupied by steel among them.

Among the means now employed, compressed air, hot water and the storage battery were cited from an English writer as being about equal in value, and as giving out about 6,500 ft. lbs. of work per pound of material used.

Steel springs, according to the same writer, were said to yield about 18 ft. lbs. per pound. In this connection, the project of using steel springs as a motor for street cars was referred to as the most hopeless of all possible means of locomotion.

To test the accuracy of this statement in regard to steel, several experiments were made by the writer upon tempered specimens, both for tension and flexure. Contrary to expectation, the highest results were shown by the flexure of a small spiral clock spring weighing 2,040 grains, which gave out, when wound up, about 45 ft. lbs. of energy, or in other words, 154 ft. lbs. per pound.

The transverse strength of this steel within the elastic limit was found to be about 300,000 lbs. per square inch, and its modulus of elasticity about 30,000,000. Such extraordinary strength, with such a low modulus, was so far beyond conjecture that it seemed to give a new hope for the success of the project referred to; but after making the necessary allowances for weight of car and efficiency of driving mechanism, it was found that not more than about 20 ft. lbs. per pound of car would be available for locomotion. It was therefore improbable that such a car could ascend a hill over 20 feet high.

It was also a matter of doubt whether larger springs could be made to show results which would even approach these figures, and on this account the experiments about to be tried might be looked for with some interest.

Mr. H. C. Lüders presented a description, illustrated by photographs, of the ancient ship found near Sandefjord, in Norway.

He also exhibited specimens of rolled and annealed phosphor-bronze of maximum ductility, and consequently of minimum tensile strength, and submitted the following data of the test thereof: length, 2 in.; diameter, 0.57 in.; subjected to a strain of 13,620 lbs., equivalent to 53,400 lbs. per square inch; elongation, 70.5 per cent.; reduced area at point where fracture would occur, 0.3 in.; elastic limit, about 18,000 lbs. per square inch. Hard-rolled rods tested without turning off the surface, have shown a tenacity exceeding 90,000 lbs. per square inch.

Mr. Percival Roberts, Jr., gave some account of the results of experiments now being conducted by Mr. James Christie at Pencoyd, upon the relative elasticity of iron and steel structural shapes.

American Institute of Mining Engineers.

The following is provisionally announced for the annual meeting in Cincinnati:

Tuesday, Feb. 19.—Opening session at 8 p. m. Addresses of welcome by the Mayor of Cincinnati and others. Reading of papers.

Wednesday, Feb. 20.—Sessions for reading papers, morning and afternoon. Banquet in the evening.

Thursday, Feb. 21.—Session for reading papers, etc., in the morning. Visits to works and places of interest in Cincinnati and Newport, Ky. Reception in the evening at the house of Mr. T. H. Aldrich, Southern avenue, Mount Auburn.

Friday, Feb. 22.—Excursion over the Cincinnati Southern Railroad. Opera Festival in the evening.

Headquarters will be at the Grand Hotel, where arrangements have been made for board at \$3 per day, bathrooms, etc., extra. The rates at other hotels are as follows: Burnet, \$3 to \$4.50; Gibson, \$3 to \$4.50; Emery, \$3 to \$4; Palace, \$3 to \$4; St. James, \$2.50 to \$3.

The Railway Club of Cincinnati tenders to the members of the Institute during their stay in the city the privileges of its rooms in the Ortiz Building, on Fourth street.

Members intending to be present at this meeting are requested to give notice, as early as practicable, to Mr. L. E. Warner, 13 Johnston Buildings, Cincinnati, Chairman of the Local Committee. It is highly important that the Local Committee should be able to judge how many members and ladies are to be entertained, that adequate facilities may be provided. Members desiring hotel accommodations should be prompt in giving notice as above, since the Opera Festival will bring large numbers of other guests to the city.

Negotiations are in progress to secure reduced rates of railway fares for members and ladies attending the meeting, and the results will be made known to those members who signify to the Secretary their intention to be present. For this purpose, and for such further announcements as may be required, it is desired that, in addition to the notice given to the Chairman of the Local Committee, members also promptly notify the Secretary at New York.

The following papers have been promised for this meeting, besides others partially promised:

"Physical Tests of Metals," by Arthur V. Abbott, New York City.

"Sulphur Determinations in Steel," by Magnus Troilius, Nicetown, Pa.

"Tables for Facilitating the Heat-Calculations of Furnace-Gases containing CO, CO, CH, H and N," by Magnus Troilius, Nicetown, Pa.

"Further Determination of Manganese in Spiegel," by George C. Stone, Newark, N. J.

"Note on the Determination of Phosphorus in Iron," by Frank Julian, Iron Mountain, Mich.

"Note Concerning Certain Incrustations on Pig-Iron," by Frank Firmstone, Glendon, Pa., and Kenneth Robertson, Jersey City, N. J.

"The Phosphate Deposits of Canada," by T. Sterry Hunt, Montreal, Canada.

"A Silver Amalgamation Mill," by G. W. Maynard, New York City.

"The Test Commission Bill," by Thomas Egleston, New York City.

"The Benefit Fund of the Lehigh Coal & Navigation Co.," by Joseph S. Harris, Philadelphia, Pa.

The Secretary begs leave to call the attention of members to the subject of the last named paper, as one of the greatest importance and interest to mining and metallurgical industries. It is believed that many members of the Institute possess valuable experience in the matter of organizing and administering funds for the benefit of workmen, and that a comparison of opinions and results cannot fail to be generally useful. Members desiring to contribute to such a dis-

cussion are requested to notify the Secretary, and send to him their remarks in writing, if they do not expect to be personally present.

Baltimore & Ohio Employees Relief Association.

The annual report of the Secretary, W. T. Barnard, submitted at the quarterly meeting of the Committee of Management of the Baltimore & Ohio Railroad Employees Relief Association in Baltimore last week, shows that the receipts during the past fiscal year have been as follows: From premiums of members, \$233,964; interest from Baltimore & Ohio Co.'s donation of \$100,000, and from temporary investment of funds, \$12,805; balance on hand at close of last fiscal year, \$92,011; total receipts, \$338,780; disbursements to members in payment of accidental benefits and death losses during the year, \$188,253; to physicians, hospitals and for medicines distributed among members to prevent and check diseases, \$13,829; aggregate disbursements, \$202,082; from the balance, \$136,698, there is due for outstanding liabilities to members, physicians, hospitals and for insurance reserve and annuities, \$85,967, leaving the net balance, \$50,726.

During the year 8,824 payments were made to members, physicians and hospitals, aggregating \$197,643, and during the 41 months of its existence the total number of payments has been 24,776, costing \$538,749, an average of \$26.73 per claim.

During the year ended Sept. 30, 1883, the total receipts of the savings fund were: From depositors, \$82,555, and from all other sources, \$26,931; total, \$109,486. During the same period the withdrawals of deposits amounted to \$7,762, while disbursements on account of loans and investments were \$73,494.

During the year the association built for members a number of houses, advancing money for this purpose at 6 per cent. interest. It also loaned funds for the improvement or purchase of houses already constructed.

The report winds up with very interesting statistical data explanatory of the foregoing and of the medical details of the association.

Mr. Robert Garrett, President pro tem. of the Baltimore & Ohio Co., and ex-officio a member of the Committee of Management, participated in the debate on this report. He said substantially that he had always carefully watched the progress of the association with much interest, but regarded it as an institution exclusively under the control of its members, and feared that even apparent participation in its operations by the management of the company was unwise, as liable to misconstruction. The management of the association had succeeded in building up the greatest benevolent railway institution that exists in this or perhaps any country. He had watched the constantly growing interest on the part of employees, as they realized fully the immense benefit of this association, and believed the company had profited by an increased efficiency of its old employees who were anxious to enjoy the benefits it confers, and also through the better physical and mental condition of those newly entering the service under the careful medical examination inaugurated by the association. He believed that if certain additional features, such as superannuation, free library, increased hospital facilities and a sanitarium, which were contemplated, can be added to those under which provision is made for relief in sickness, accident and death, and savings and building features, the usefulness of the association would be greatly enhanced.

In any programme for new features, increased educational facilities should receive encouragement and hearty support from all who take an interest in the society, because the prosperity of those growing up in the service will depend upon the extent to which they avail themselves of the advantages which the society gives and may hereafter offer them. While the society had done a great deal in relieving suffering and want, its members yet experienced certain other wants which should be met by additional features until all the objects set forth in its charter were accomplished. The society had already more than fulfilled the most sanguine expectations of its founders, and its uniform growth shows an improved understanding of its missions and the intention of the company in establishing it. He commented earnestly upon the advantages accruing both to the society and the company from a strict physical examination of all new employees, and the necessity for wise and conservative action in dealing with the funds which accumulated from year to year.

The Baltimore & Ohio, which built the first railroad in the United States, over whose lines the telegraph was first practically operated, and which has been foremost in a great many matters of importance to the country, has been foremost in the establishing of a society which, if carried out to its legitimate end, will do more to bring about the proper relations between capital and labor than all the bills which can be recommended by your governors, or passed by your legislatures.

He felt great pride in what had been accomplished and thought the committee had great cause for congratulation, yet he hoped to see the time when all the company's men will be taken care of when they become aged and infirm, and when they will be provided for in every case of hardship that can be imagined and for which there exists necessity for relief. Without being able to commit the company in any way to a definite programme, he felt certain that those prominent in the management of the company are very earnest to promote the interests of the men in every practical way, and he hoped to see the day when every man in the service would have a roof of his own over his head; when they will have pecuniary interests in the vast property of the company, and when the men who run the trains and operate the machinery, and all others having steady employment, will be identified with and be part owners of the Baltimore & Ohio Co. This was no chimerical idea, because he has seen this result practically attained on the continent, where some of our features are in operation on railways, and where he had seen that through the judicious husbandry of their savings the men became joint owners with the capitalists of the largest railway enterprises.

He wished especially to see a sanitarium and a home for aged employees established ultimately, so that when they or their families become sick or broken down, or become old and infirm, they can by simply devoting part of their pension to paying the cost of their board, have all the comforts and advantages of a well-conducted hotel and home, and he thought he saw this in sight without improperly draining the resources of the association or the railroad company.

ELECTIONS AND APPOINTMENTS.

Belvidere Delaware.—At the annual meeting of this company (whose road is leased to the Pennsylvania Railroad Co.) in Trenton, Feb. 4, Mr. Wm. H. Wilson was chosen President in place of Strickland Kneass, deceased, and the old directors were re-elected.

Boston, Barre & Gardner.—At the annual meeting in Worcester, Mass., Feb. 6, the following directors were chosen: Calvin Foster, W. W. Rice, Charles G. Reed, Stephen Salisbury, Jr., S. R. Haywood, A. G. Bullock, Henry M. Witter, Wm. H. Morse, E. W. Vaill, Nelson D.

White, Franklin Eaton. The board elected Wm. H. Morse President in place of H. M. Witter, and re-elected H. H. Marshall Superintendent, and W. E. Starr, Clerk and Treasurer.

Camden Short Line.—The officers of this new company are: President, W. A. Ancrum; Directors, F. S. Zemp, J. T. Hay, F. P. Beard, S. B. Latham, F. W. Eldridge, E. W. Parker; Secretary and Treasurer, J. T. Hay. Office in Camden, South Carolina.

Canadian Pacific.—Mr. Thomas G. Shaughnessy has been appointed Assistant General Manager. He was recently on the Chicago, Milwaukee & St. Paul.

Chicago, Milwaukee & St. Paul.—Mr. N. J. Underwood is appointed Superintendent of the Sioux City & Dakota Division.

Chicago & Northwestern.—Mr. W. Hutchinson has been appointed Master Mechanic in charge of the shops at Council Bluffs, Iowa.

Chicago, St. Louis & Pittsburgh.—Mr. H. W. Wynkoop has been appointed Superintendent of Telegraph in place of O. H. Booth, deceased.

Chicago & Western Indiana.—Mr. E. W. Parker, Superintendent of this road, having resigned, the office is abolished, and its duties will be performed by the General Manager.

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. T. W. Ransom has been appointed Master Mechanic of the Indianapolis & St. Louis Division in place of J. K. Lape, resigned.

Connotton Valley Ry.—Samuel Briggs, Receiver, announced the following appointments on Jan. 19, to take effect on that date: Augustus Thierry, Treasurer; Fred. E. Smith, Auditor; O. D. Lelensing, Chief Engineer; B. C. Bosworth, Master Mechanic; R. D. Briggs, Master of Transportation; Fred. W. Jones, Road master; Day & Lynch, Attorneys. V. Menuez, Jr., was appointed Train Dispatcher on Jan. 20.

Cumberland Valley.—The following notice has been issued by Mr. Thomas B. Kennedy, President of this company: "Mr. W. L. Ritchey has been appointed Auditor Cumberland Valley Railroad, in place of John L. Ritchey, deceased, the appointment to take effect Jan. 29, 1884."

Delaware Division Canal.—At the annual meeting in Philadelphia, Feb. 5, the following managers were elected: J. W. Woolston, I. V. Williamson, J. S. Harris, E. W. Clark, F. C. Yarnall, S. F. Corlies, F. R. Cope, E. Roberts, Jr., T. McKean.

Fall Brook Coal Co.—Geo. J. Magee, President, announced on Dec. 31, 1883, that H. A. Horning, previously General Agent of this Company, had been appointed Traffic Manager, in charge of the passenger and freight traffic. His appointment took effect on Jan. 1. Also, on Jan. 22 that J. B. Terbell had been appointed Car Accountant of this company, in place of C. K. Minor, resigned, dating from Feb. 1.

Fitchburg.—Circulars have been issued by this company which announce that from Feb. 1 Mr. E. K. Turner, Chief Engineer, will take charge of the department of maintenance of way, including all matters of construction and repairs, and at the same time be relieved of his duties as Assistant Superintendent. Mr. J. R. Hartwell has been appointed Train-Master of the Fitchburg Division, and Mr. W. J. Fox Train-Master of the Fitchburg & North Adams Division. The train-masters will have full supervision of freight train conductors and brakemen, with the responsibility of employing or discharging the same.

Gettysburg & Harrisburg.—Mr. Wm. H. Woodward is Superintendent of this road, with office at Pine Grove Furnace, Pennsylvania.

Huntingdon & Broad Top Mountain.—At the annual meeting in Philadelphia, Feb. 5, the following were chosen: President, B. Andrews Knight; Directors, Rathmell Wilson, John Devereux, I. V. Williamson, James Long, James Whitaker, Joseph H. Trotter, William P. Jenks, C. W. Wharton, Thomas R. Patton, Jacob Naylor, Spencer M. Janney, William J. Barr.

B. Andrews Knight, President, announces that Geo. F. Gage has been appointed General Manager of this road, the old title of General Superintendent having been abolished. He will continue to discharge the same functions at the Huntingdon office, under the new as under the old title.

Kentucky Central.—Mr. C. W. Smith has been appointed General Manager. He holds the same position on the Chesapeake & Ohio.

Massachusetts Railroad Commission.—Mr. Wm. A. Crafts, who was Clerk of the Commission from its first organization until he was displaced by Gov. Butler a few months ago, has been restored to his old position, for which he was so eminently fitted.

Soon after his inauguration, Gov. Robinson addressed the following letter to Mr. Thomas Russell, Chairman of the board:

"Dear Sir: Some weeks since you addressed me a communication calling my attention to the character of the service rendered by the Clerk of your board, and signifying a desire to express to me in full your judgment upon his efficiency in said capacity. Having in view the proper performance of duty to your board, I should be pleased to know from you whether, in the opinion of yourself and your associates, Mr. Litchman is a competent, reliable, trustworthy man in a degree satisfactory to the board and to the reasonable demands of the public interests."

To this letter Mr. Russell returned the following answer: "Dear Sir: In answer to your inquiry as to the clerkship of the board, I would say that Mr. Crafts acted as Clerk from its organization in 1869 until his removal in 1883, serving with entire fidelity, and devoting all his time and attention to his official duties."

"It is no reproach to his successor to state that Mr. Crafts' removal was a serious injury to those who have dealings with the Commission. For no man could at once fill the place, and no man could ever become master of the details of transactions extending over a space of 14 years, including a great variety of transactions."

"Mr. Crafts had become familiar not only with the records and reports of the board, but also with the vast number of matters never recorded or reported. He knew the full history of railroad enterprises, hearings and investigations—knowledge equally rare and valuable."

"Such information is the more desirable in a clerk, because, while the commissioners are inspecting roads or hearing cases in distant places, he is in charge of the office and is expected to answer many questions."

"The possession of these facts, with his industry, promptness, fidelity and courtesy, made Mr. Crafts a general favorite with persons having business here; and his withdrawal caused much regret."

"While I fully appreciate the abilities and merits of his successor, it is a plain duty to state to your Excellency that

with a view to the public interests the early restoration of Mr. Crafts to his old place is a simple act of justice to the community, so far as it is interested in railroad matters, and that in my belief it will be a benefit to the public service."

Gov. Robinson thereupon issued an order removing Mr. Litchman and restoring Mr. Crafts to his old office.

Meriden & Cromwell.—At the annual meeting in Meriden, Conn., Feb. 3, the following officers were chosen: President, H. C. Wilcox; Secretary, C. L. Rockwell; Treasurer, A. Chamberlain.

Michigan Central.—Mr. A. R. Trew has been appointed Assistant Engineer in charge of Niagara River Bridge. Office at Suspension Bridge, N. Y.

Missouri Pacific.—John Hewitt has been appointed Superintendent of Machinery of the St. Louis, Iron Mountain & Southern Division, with headquarters at St. Louis, Mo., vice O. A. Haynes, and John Hodge, Master car-Building, vice H. H. Sessions.

Natchez, Jackson & Columbus.—At the annual meeting, Jan. 22, the following directors were elected: Will T. Martin, R. F. Learned, Jas. Surget, Geo. M. Brown, T. T. Hart, Geo. W. Koontz, J. C. Schwartz, T. Otis Baker, J. N. Carpenter, R. L. Saunders, W. R. Kirby, A. D. Rawlings, Louis Botto. Subsequently the board met and elected the following officers: President, Will T. Martin; Secretary, J. M. Kern; Treasurer, Geo. W. Koontz.

Newark, Somerset & Stratsville.—At the annual meeting in Newark, O., Jan. 23, the following directors were elected: Robert Garrett, Samuel Spencer, Osmon Latrobe, Orland Smith, G. J. Foreacre, T. J. Davis, Wm. Shields, J. C. Larwill, C. H. Kibler, David Lee, W. H. Harrison. The board elected David Lee President; J. Hope Sutar Secretary. The road is leased to the Baltimore & Ohio.

New York, Lake Erie & Western.—The following circulars from President H. J. Jewett are dated Feb. 1:

"E. S. Bowen has been elected one of the Vice-Presidents of this company, vice Robert Harris, resigned. He will act for the President in all matters connected with the roadway and structures, real estate, and the operations of the transportation department, and in the discharge of such other duties as the President may from time to time assign to him."

"B. Thomas is hereby appointed General Superintendent of this company, with headquarters at Jersey City, and will assume the duties of his office immediately."

"D. H. Blackham is hereby appointed Superintendent of Transportation of this company and will assume the duties of his office at once."

New York, Ontario & Western.—Mr. J. E. Childs has been, at his own request, relieved from his duties as Assistant General Superintendent New York, West Shore & Buffalo Railway, in order that he may give his entire time to his duties as General Superintendent New York, Ontario & Western Railway.

New York, Providence & Boston.—Mr. D. S. Babcock, Vice-President and General Manager, issues the following general order:

"Mr. J. B. Gardiner, Superintendent, who has heretofore acted as General Freight Agent of this company, is hereby relieved from the duties pertaining to the freight department, in accordance with the changes noted below:

"Mr. E. F. Bradford is hereby appointed General Freight Agent of the company, to take effect Feb. 1, 1884."

"Station agents will refer all applications for rates, and report all over, short, and damaged freight, direct to General Freight Agent, and will be governed by his instructions."

"All claims for loss or damage must be referred to the General Freight Agent, who will after investigation and approval, forward the same to A. R. Longley, Jr., Secretary of the Company, for payment."

"Mr. A. K. Tillinghast is hereby appointed local agent at Providence station, in place of A. F. Kenyon, and will assume his duties from this date."

New York, West Shore & Buffalo.—Mr. Charles D. Gorham has been appointed Assistant General Superintendent. His office will be at Weehawken Passenger Station. Appointment took effect Feb. 1. Mr. Gorham, who was recently on the Chicago & Northwestern, succeeds Mr. J. E. Childs, who will hereafter give his whole time to his duties as General Superintendent of the New York, Ontario & Western road.

Norfolk & Virginia Beach.—The officers of this road are as follows: Marshall Parks, President; J. M. Dicky, General Manager; W. J. Welsh, Treasurer; H. W. Page, Secretary; A. J. Armstrong, Auditor.

Northeastern, of Georgia.—Hon. Pope Barrow has been elected President of this company.

Northern Pacific.—The following order was issued Feb. 1 by Mr. T. F. Oakes, Vice-President and General Manager:

"John Muir having resigned the position of Superintendent of Traffic and accepted that of General Manager of the Oregon Improvement Co., the following appointments are hereby announced: J. M. Hansford, General Freight Agent in charge of the main line and branch office at St. Paul; Charles S. Fee, General Passenger Agent, in charge of both passenger and ticket departments, main line and branches, office at St. Paul; H. C. Davis, Assistant General Passenger Agent, office at St. Paul; A. D. Charlton, General Western Passenger Agent, office at Portland, Oregon. The official designation of A. L. Stokes will be in future Assistant General Freight Agent, office at Portland, Oregon. The appointments will take effect March 1, 1884."

Owensboro & Nashville.—The present list of officers of this road is as follows: Milton H. Smith, President; W. M. Newbold, Superintendent; H. C. Gans, Treasurer and Auditor; R. S. Bevier, Chief Attorney; S. L. Chambers, General Freight and Passenger Agent.

Pennsylvania.—Mr. W. Hazell Wilson having resigned his position as Real Estate Agent of the company to become officially connected with some of the branch lines, Mr. John C. Wilson (late Assistant to the Chief Engineer) has been appointed Real Estate Agent.

Pennsylvania Company.—Mr. Edmund Yardley has been appointed General Car Accountant, with office at Allegheny, Pa. He will have charge of all car records.

Mr. H. W. Wynkoop has been appointed Superintendent of Telegraph in place of O. H. Booth, deceased.

Petersburg.—Mr. L. E. Clark has been appointed Treasurer in place of W. P. Taylor, deceased. Mr. George F. Jones succeeds Mr. Clark as Auditor and Purchasing Agent.

Pittsburgh, Cincinnati & St. Louis.—The following circular from Mr. James McCrea, Manager of this road, is dated Columbus, O., Jan. 31:

"Mr. H. W. Wynkoop has been appointed Superintendent of Telegraph, vice O. H. Booth, deceased. The ap-

pointment to date from Jan. 1, 1884. His duties will be as follows:

"First. He will have general supervision of the condition of all lines of telegraph wires connected with the operation of the Southwest system.

"Second. He will communicate freely with the division superintendents, their division operators, and the district superintendents of the Western Union Telegraph Co., in regard to matters connected with the condition of the lines and the prompt transmission of business.

"Third. He will pay particular attention to the distribution and use of such supplies as are required for the construction of new and repair to old lines, and see that they are used to the best advantage.

"Fourth. He will communicate from time to time with the Manager of the Southwest system, and the General Superintendent of the Western Union Telegraph Co., in regard to general questions concerning the mutual interests of the companies and the fulfillment of the terms of the contracts existing between them.

"Fifth. He will be aided by an Assistant, who will transact business in his name.

"Sixth. His office will be at Columbus, Ohio."

Pittsburgh, Cincinnati & St. Louis Leased Lines.—At the annual meetings in Columbus, O., last week, directors were elected as below by the companies named, whose roads are leased to the Pittsburgh, Cincinnati & St. Louis: *Little Miami*.—Directors, Louis Ballauf, Henry Hanna, Julius Dexter, L. B. Harrison, Frank J. Jones, A. D. Bullock, Charles P. Cassilly, W. H. Clement, Thomas D. Messler, Joseph H. Rogers, J. R. Swan, William Worthington. *Columbus & Xenia*.—President, J. R. Swan; Directors, H. C. Noble, J. W. Andrews, P. W. Huntington, G. M. Parsons, William B. Hayden, Henry Hanna, C. P. Cassilly, Thomas D. Messler; Secretary and Treasurer, Robert S. Smith.

Providence & Worcester.—At the annual meeting in Providence, R. I., Feb. 4, the following directors were chosen: Jonas G. Clark, Lyman A. Cook, John W. Danielson, Joseph G. Davis, Moses B. I. Goddard, Frederick Grinnell, Josiah Lasell, Estus Lamb, George A. Leete, David K. Phillips, Oscar J. Rathbun, Gideon L. Spencer, Elijah B. Stoddard, Benjamin F. Thurston, Charles E. Whitin.

St. Louis & San Francisco.—Mr. W. L. Van Nest is appointed General Eastern Agent for this company, with offices at 229 Broadway, New York, and 306 Washington street, Boston, vice Mr. W. P. Robinson, Jr., resigned.

Savannah, Florida & Western.—The following circular from Superintendent R. G. Fleming is dated Savannah, Ga., Jan. 26:

"Mr. O. W. Jackson is hereby appointed Master of Transportation. Appointment to take effect on the 1st proximo."

Sinaloa & Durango.—Mr. Robert R. Symon has been elected Vice-President and General Manager, in place of Edward P. North, resigned.

Toledo, Ann Arbor & Grand Trunk.—Mr. B. F. Jervis is now Assistant Treasurer of this company, with office in Toledo, Ohio.

Union Canal.—At the annual meeting in Philadelphia, Feb. 5, the following were chosen: Grant Wiedman, President; Frederick Fraley, George deB. Keim, T. C. Zulick, W. A. Church, Charles H. Quarles, Managers; George S. Bowman, Secretary and Treasurer.

Union Pacific.—This company has just issued a bulletin, giving its passenger staff abroad, which is this:

M. T. Dennis, New England Agent; J. S. Smith, A. C. Harvey, traveling agents, Boston, Mass.

J. E. Parker, Traveling Agent, Montreal, Quebec.

F. Knowland, General Eastern Agent; J. F. Wiley, City Passenger Agent, New York.

G. W. Keeler, General Agent; W. P. Cooley, Traveling Agent, Philadelphia.

D. E. Burley, Traveling Agent, Baltimore.

C. S. Blackman, Traveling Agent, Buffalo, N. Y.

W. F. Herman, Traveling Agent, Cleveland, O.

Ira P. Griswold, Traveling Agent, Detroit, Mich.

J. D. Welsh, General Agent, Cincinnati, O.

T. C. Hirst, Traveling Agent, Columbus, O.

N. Height, Traveling Agent, Louisville, Ky.

A. S. Burges, Traveling Agent, Indianapolis, Ind.

D. B. Quinlan, Traveling Agent, Chicago, Ill.

T. B. Gault, General Agent; Geo. Young, City Passenger Agent, Chicago, Ill.

R. P. Rollins, Traveling Agent, Chicago, Ill.

Hoyt Sherman, Jr., Traveling Agent, Chicago.

N. C. Treat, Traveling Agent, Quincy, Ill.

J. F. Aglar, General Agent; E. R. Tuttle, Traveling Agent, St. Louis, Mo.

D. E. Cornell, General Agent; J. B. Reese, Traveling Agent, Kansas City, Mo.

T. H. Russell, Passenger Agent, Deadwood, Dak.

Geo. Ady, General Agent; D. L. Sturgis, Traveling Agent, Denver, Col.

W. C. Borland, General Agent, Salt Lake City, Utah.

J. J. Fallon, Traveling Agent, Helena, Mont.

D. W. Hitchcock, General Western Passenger Agent; C. L. Hanna, Traveling Agent, San Francisco, Cal.

George J. Cowan, Assistant General Western Passenger Agent, Portland, Oregon.

United States Rolling Stock Co.—At the annual meeting in New York, Feb. 5, the following trustees were chosen: H. R. Baltzer, Frederick W. Foote, Wm. H. Guion, A. Hegewisch, Cyrus D. Roys. The board re-elected A. Hegewisch President; Thomas F. B. Parker, Secretary; C. Benn, Treasurer.

Utica, Ithaca & Elmira.—The following officers have lately been appointed, with offices at Elmira, N. Y.: George S. Sadler, Superintendent; V. B. Myrtle, Assistant General Freight and Passenger Agent; Edward Mahler, Purchasing Agent.

Virginia Midland.—Mr. George S. Scott has been chosen Vice-President in place of Col. A. L. Rives. Col. Rives continues General Manager of the road.

Wisconsin, Iowa & Nebraska.—At the annual meeting, Jan. 21, the following directors were chosen: Dr. Shradler, J. B. Hatter, W. J. Schell, H. W. Fyffe, E. B. Moore, John Whetstone, C. F. Lovelace, Lyman Parsons.

PERSONAL.

—Mr. J. K. Lape has resigned his position as Division Master Mechanic of the Cleveland, Columbus, Cincinnati & Indianapolis road.

—Mr. Russell Harding has resigned his position as Resident Engineer of the International & Great Northern road, and will go into the lumber business.

—Mr. Henry A. Chace, for a number of years Assistant Superintendent of the Boston & Providence road, died at his residence in Pawtuxet, R. I., Feb. 5.

—Mr. L. W. Sandforth, late Superintendent of the Danbury & Norwalk road, has accepted a position in connection with the building of the new Hartford & Harlem road.

—Mr. Theodore Hartman has resigned his position as General Superintendent of the Little Rock & Fort Smith and the Little Rock, Mississippi River & Texas roads, to take effect March 1, next.

—Mr. Daniel Hardy has resigned his position as Division Superintendent of the Atlantic & Pacific road, and will, it is said, accept a position on a northwestern road. He served on the Denver & Rio Grande and the Atchison, Topeka & Santa Fe before going to the Atlantic & Pacific.

—Samuel A. Medary, for several years past Paymaster of the Cincinnati, Hamilton & Dayton, having resigned, it is stated by the Cincinnati papers that his resignation was caused by the discovery of a deficiency in his accounts, the amount of which is still uncertain. The company has so far withheld all information in the case, although it is said that its officers admit that there was a considerable deficit.

—Mr. Harry E. Packer, President of the Lehigh Valley Railroad Co., died at his residence in Mauch Chunk, Pa., Feb. 1, aged 33 years, after a long and painful illness. Mr. Packer was a younger son of the late Judge Asa Packer, who was for many years President of the Lehigh Valley Co. He graduated at Lehigh University, at Bethlehem, in 1870, and was soon after given a position on the road. He served in various capacities until 1879, when he was made Superintendent of the New Jersey Division and a director of the company. In 1881 he was made Vice-President of the company, and shortly after President, succeeding his father. He was considered a young man of much promise, but as President of the company had been able to do but very little active work on account of ill health. He leaves a widow but no children.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Month of January:	1884.	1883.	Inc. or Dec.	P. c.
Central Iowa.....	\$110,918	77,309	I.	33,609 43.5
Chi. & Alton.....	660,812	646,385	I.	14,427 2.2
Chi. & East. Ill.....	126,091	138,864	D.	12,773 9.2
Chi. & G. Trunk.....	167,825	189,844	D.	22,019 11.6
Chi., Mil. & St. P.....	1,467,000	1,359,190	I.	107,810 7.9
Chi. & Northwest.....	1,462,300	1,357,600	I.	104,700 7.7
Chi., St. P., M. & Omaha.....	343,100	312,300	I.	31,100 9.9
Denver & R. G.....	474,900	448,500	I.	26,400 5.9
Det., Lan. & No.....	89,854	107,432	D.	17,578 19.4
Long Island.....	133,891	126,993	I.	6,898 5.4
Louis. & Nash.....	1,037,000	1,118,735	D.	81,735 7.3
Mil., L. S. & W.....	69,705	65,382	I.	4,323 6.7
Mobile & Ohio.....	185,539	216,212	D.	30,673 14.2
Net earnings.....	45,539	70,743	D.	25,304 35.6
Roch. & Pitts.....	67,304	78,834	I.	11,530 17.1
St. L. & San F.....	319,610	278,273	I.	41,337 14.9
St. P. & Duluth.....	72,768	71,461	I.	1,307 1.8
St. P., M. & M.....	449,185	489,541	D.	40,356 8.2
Shenandoah Val.....	41,286	36,710	I.	4,576 12.4

Third week in January:	1884.	1883.	Inc. or Dec.	P. c.
Bur. Cedar Rap. & Northern.....	\$53,900	\$43,388	I.	\$10,512 24.4
Ches. & Ohio.....	50,076	52,555	I.	2,479 4.9
Eliz. Lex. & B. S.....	10,479	9,966	I.	513 5.2
Ill. Central.....	243,900	267,419	D.	23,519 8.8

Month of December:	1883.	1882.	Inc. or Dec.	P. c.
New Or. & N. E.....	\$51,340	\$1,795,372	I.	\$502,271 28.0
Phila. & Read.....	2,297,643	838,609	I.	46,948 5.6
Net earnings.....	885,557	1,110,456	I.	224,899 25.4
P. & R. Coal and Iron Co.....	1,110,456	1,069,829	I.	40,627 3.8
Net earnings.....	416,110	5,174	I.	411,936 79.6

* Deficit.
Weekly reports of earnings are generally estimated in part, and are subject to correction by later statements.

Grain Movement.

For the week ending Jan. 26 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.....	1,721,443	839,521	1,546,128
1878.....	3,513,465	2,272,058	2,662,375
1879.....	3,597,455	1,350,918	1,778,971
1880.....	3,632,141	1,571,994	3,691,835
1881.....	3,287,602	1,656,550	2,053,554
1882.....	5,297,541	3,156,232	1,905,946
1883.....	3,245,065	1,875,475	2,730,600
1884.....	4,245,990	2,508,697	2,128,505

Thus the receipts of the Northwestern market for the week this year were 1,000,000 bushels more than last year, when they were greatly reduced by snow blockades, and larger than in any other year except 1882. They were, however, 815,000 bushels less than in the previous week of this year. The shipments of these markets were also larger than in the corresponding week of any previous year except 1882, when the rates were the lowest ever known. The receipts of the Atlantic ports were exceeded last year, in 1880 and in 1878, but they were 514,000 bushels more than in the previous week of this year, and were the largest for six weeks. Last year there was no week in the winter when the Atlantic receipts were so small.

Exports from Atlantic ports for the week ending Jan. 26 have been, for five years:

Year.	1880.	1881.	1882.	1883.	1884.
Flour, bbls.....	95,132	101,920	303,028	98,450	98,450
Grain, bu.....	1,755,511	2,209,785	981,027	2,333,814	1,690,621

The exports were thus smaller this year than in any of the others except 1881.

Coal.

Coal tonnages for the week ending Jan. 26 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite.....	425,651	265,416	I.	160,035 60.2
Eastern bituminous.....	102,142	155,006	I.	6,536 4.2
Coke.....	53,446	61,947	D.	8,501 13.2

The anthracite market is quiet, although some additional demand for domestic purposes has been caused by very cold weather.

The seaboard bituminous trade is a little more active, and the usual contest for the large railroad and manufacturing contracts has begun.

The coal tonnage of the Pennsylvania Railroad for the week ending Jan. 26 was:

	Coal.	Coke.	Total.
Line of road.....	133,390	49,258	182,748
From other lines.....	48,515	4,088	52,603
Total.....	181,905	53,446	235,351

The total tonnage this year to Jan. 26 was 8,861,446 tons, again at 903,618 tons to the corresponding date last year; a decrease of 42,167 tons, or 4.7 per cent.

Cumberland coal tonnage for the month ending Feb. 2 is reported by the *Cumberland Civilian* as follows:

Shipments from mines:	1884.	1883.	Inc. or Dec.	P. c.
Cumberland & Penna.....	105,594	107,922	D.	2,328 2.2
George's Creek & Cumb.....	10,341	24,186	D.	13,845 57.7
West Va. Cent. & Pitts.....	32,234	19,945	I.	12,289 61.5
Direct to B. & O.....	113	565	D.	452 80.0

Total.....	148,282	152,618	D.	4,336 2.8
Shipments out of region:	126,813	128,263	D.	1,450 1.1
Balt. & Ohio R. R.....	21,460	24,355	D.	2,895 11.9
Pennsylvania R. R.....	105,353	103,908	I.	1,445 1.4

Total..... 148,282 152,618 D. 4,336 2.8

Local deliveries are included in the Baltimore & Ohio tonnage for the month.

The anthracite coal tonnage passing over the Belvidere Division, Pennsylvania Railroad, for the month of January was as follows:

	1884.	1883.	Inc. or Dec.	P. c.
S. Amboy for shipment.....	37,818	63,954	D.	26,136 40.8
Local points on N. J. divs.....	66,577	64,027	I.	2,550 4.0
Co.'s use on N. J. divs.....	17,011	12,471	I.	4,540 36.3

Total..... 121,406 140,452 D. 19,046 13.6

Of the total this year 97,456 tons were from the Lehigh Region, and 23,950 tons from the Wyoming Region.

Actual tonnage passing over the Huntingdon & Broad Top road for the month ending Feb. 2 was:

	1884.	1883.	Decrease.	P. c.
Broad Top coal.....	18,136	21,894	3,758	17.1
Cumberland coal.....	23,335	26,611	3,276	12.2

Total..... 41,471 48,505 7,034 14.5

The Broad Top coal is mined on the line; the Cumberland coal is hauled through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad.

Petroleum.

The production of the Pennsylvania and New York oil fields for December is given by Stowell's *Petroleum Reporter* as follows, in barrels of 42 gallons:

	1883.	1882.	Inc. or Dec.	P. c.
Production.....	1,988,526	1,897,510	I.	91,016 4.8
Shipments.....	1,749,547	1,121,453	I.	628,094 56.0
Stock, Dec. 31.....	35,745,632	34,596,612	I.	1,149,020 3.3
Producing wells.....	20,606	18,000	I.	2,606 14.5

The production was exceeded in four other months of 1883, in every month but one of 1882 and in every month of 1881. Of the total production the Allegheny District in New York furnished 15.7 per cent., the Bradford District in Pennsylvania 57.7, the Warren District 15.7, and the Lower District 11.0 per cent.

The shipments, which have for several months exceeded the production, again fell below it in December.

The stock, which is all in the pipe lines, increased 238,979 barrels during the month, that being the excess of production over shipments.

During the month 272 new wells were completed and 25 dry holes were developed. At the close of the month there were 263 wells in process of drilling.

Of the shipments reported from the wells 406,904 barrels, or 23.3 per cent., were by rail, and 1,342,643 barrels, or 76.7 per cent., by pipe line.

Shipments out of the region were as follows:	P. c. of total.
New York.....	742,764 42.4
Philadelphia.....	153,270 8.6
Baltimore.....	5,427 0.3
Cleveland.....	372,218 21.3
Pittsburgh.....	55,260 3.2
Down the Ohio.....	8,970 0.5
Local points.....	218,746 12.5
Refined at Creek refineries.....	192,886 11.0
Total.....	1,749,547 100.0

Shipments of oil refined at Creek refineries (reduced to its equivalent in crude) were: New York, 61,861; Philadelphia, 866; Baltimore, 6,183; Boston, 50,000; local points, 73,976; total, 192,886 barrels.

The *Reporter* says: "The month under review concludes the year 1883, and a glance over the course of the oil trade during the year may not be inappropriate. We can observe in our retrospect but few events of importance. When the year opened public attention was no more attracted to Cherry Grove, which had run its course and closed its career in the fall of 1882, and the points of chief interest were found in the Forest County and Butler County (Bald Ridge) fields. These districts have continued to interest oil producers during the year in review, but no permanently large wells have been brought in, and operations in older fields have engaged some attention. No operations of the year, however, deserve any special attention, and the information of chief interest is contained in the statistics for the year, which are found, complete, elsewhere in this paper. It will be found from the tables that for no month during 1883 did the daily average production of petroleum rise as high as even the yearly average for the past three years, and that the average for 1883 is 63,336 barrels, a lower average than we have had since 1879. Turning to the well account for some insight into the causes of this, we find that the average number of drilling wells for the year is less than has been the case since 1875. There were fewer wells completed last year than in any year since 1875, and the yearly average number of producing wells has commenced to decrease, something that has not been known since the same year. Considering all these facts, and also noting that the total shipments for the year are the highest yet known (although the increase over last year's total is not very great), we are in a measure prepared to understand the most interesting feature of 1883, namely, the decline in stocks which was noticeable at several times during the year. Since 1878 the stocks of petroleum on hand have steadily increased month by month, and the fact that some months of the present year have indicated a decrease is without doubt important. It is true that this decrease has not been uniform, and that some months have shown an increase instead of a decrease; the important truth indicated is that production and consumption have begun to balance, which, in connection with the tendency as to producing wells, is very cheering to those who desire better prices."

The Lackawanna and the Trunk Lines.

The Delaware, Lackawanna and Western Co. has selected Mr. Jas. F. Joy, of Detroit, as its representative in adjusting the percentages which the company is to receive in the west-bound pool. Mr. Joy has accepted the position, and will shortly meet Mr. Chas. Francis Adams, Jr., who will represent the Trunk Lines in the arbitration. If these gentlemen are unable to agree they will choose a third arbitrator.

Pacific Through Freights.

Shipments of through freight eastward from California ports for December and the year ending Dec. 31 were as follows:

	Central Pacific.	Southern Pacific.	Total	
Tons	P. c. of total.	Tons	P. c. of total.	Tons

The average shipments per day for the year over the Central were 217 tons, and over the Southern 179 tons, making a train of 23, or 18 light car-loads over the respective roads. There were 15 classes of freight shipped last year in which the totals exceeded 1,500 tons, as follows:

Wool, tons.....	17,281	Wheat, tons.....	2,580
Sugar.....	16,472	Rice.....	3,578
Canned goods.....	14,787	Barley.....	2,326
Canned salmon.....	12,292	Hops.....	2,116
Ripe fruit.....	10,565	Dried fruit.....	1,723
Tea.....	10,389	Borax.....	1,650
Wine.....	9,486	Coffee.....	1,598
Beans.....	3,569		

These 15 items of freight made up 109,422 tons, or 75.7 per cent. of the whole, miscellaneous freights constituting the remaining 24.3 per cent.

Western Commission Agreement.

A meeting of general passenger agents of Western lines was held in Chicago Jan. 31. There were present Messrs. A. V. H. Carpenter and George H. Heafford, St. Paul Road; James Charlton, Alton; P. Lowell, Burlington; W. H. Stennett and W. A. Thrall, Northwestern; E. St. John, Rock Island; S. K. Hooper, Hannibal & St. Joseph, and Howard Laying, Wabash Road. Mr. Charlton was the Chairman and Mr. Heafford the Secretary.

The subjects of rates, commissions and other matters relating to Western passenger traffic were considered. The question of commission payments was disposed of by adopting an agreement covering the points mentioned at the last meeting, and upon the basis suggested by the Rock Island road at that time. The agreement was signed at once and reads as follows:

COMMISSION AGREEMENT.

"CHICAGO, Jan. 31.—It is hereby agreed that the maximum commissions that may be paid by us, or on account of our respective lines, commencing Feb. 1, 1884, on tickets issued by any railroad or transportation company in the territory east or southeast of Chicago, to the points named below, shall not exceed the following figures:

"From Chicago or Milwaukee to all Missouri River points, between Yankton and Kansas City (both inclusive) and beyond—First class, \$3; second and third class, \$2.50; first class, round trip, \$4.

"If any party, not under the direct control of any railroad or transportation company in the territory above mentioned, shall in anywise use any portion of these commissions to cut any rates, such party shall be absolutely cut off from receiving commissions from all the lines parties to this agreement, for such length of time as may be agreed upon."

This agreement was signed by all the roads represented.

Messrs. A. V. H. Carpenter, S. K. Hooper and James Charlton were then appointed a committee to draft an agreement that will govern West-bound passenger business from Chicago to Missouri River points (between Kansas City and Yankton) and beyond.

Cotton.

Cotton movement for the five months of the cotton year from Sept. 1 to Feb. 1 is stated by the *Commercial and Financial Chronicle* as follows, in bales:

Interior Markets:	1883-84.	1882-83.	Inc. or Dec.	P. c.
Receipts.....	2,354,436	2,752,598	D. 398,162	14.5
Shipments.....	2,103,838	2,421,560	D. 317,722	13.1
Stock, Feb. 1.....	289,774	347,923	D. 47,769	13.8
Seaports:				
Receipts.....	3,981,316	4,319,947	D. 338,631	7.8
Exports.....	2,535,494	2,819,874	D. 284,380	10.1
Stock, Feb. 1.....	1,060,563	917,630	I. 142,933	15.6

It must be remembered that the total movement is not expressed by the receipts at interior markets plus those at seaports; it is in fact much less, as a large part of the cotton reported as received at interior points appears later in the seaport receipts.

After a statement showing as nearly as possible the actual receipts from plantations at the ports, the *Chronicle* says: "The statement shows—1. That the total receipts from the plantations since Sept. 1, 1883, were 4,231,914 bales; in 1882-83 were 4,650,985 bales; in 1881-82 were 4,132,132 bales.

"2. That, although the receipts at the out-ports the past week were 112,110 bales, the actual movement from plantations was only 80,964 bales, the balance being taken from the stocks at the interior towns. Last year the receipts from the plantations for the same week were 168,090 bales, and for 1882 they were 84,090 bales.

"In the table below we give the receipts from plantations in another form, and add to them the net overland movement to Jan. 1, and also the takings by Southern spinners to the same date, so as to give substantially the amount of cotton now in sight:

	1883-84.	1882-83.	1881-82.	1880-81.
Receipts at the ports to Feb. 1.....	3,981,316	4,319,947	3,787,538	4,116,544
Interior stocks on Feb. 1 in excess of Sept. 1.....	250,598	331,038	344,594	279,028
Total receipts from plantations.....	4,231,914	4,650,985	4,132,132	4,395,572
Net overland to Jan. 1.....	382,415	413,082	323,510	316,763
Southern consumption to Jan. 1.....	123,000	130,000	100,000	80,000
Total in sight, Feb. 1.....	4,737,329	5,194,067	4,555,642	4,797,335

"It will be seen by the above that the decrease in amount in sight Feb. 1, as compared with last year, is 456,738 bales, the increase as compared with 1881-82 is 181,687 bales, and the decrease from 1880-81 is 60,006 bales."

A Plan to Maintain Passenger Rates.

The local passenger and ticket agents in Chicago have made an agreement among themselves for the maintenance of passenger rates from Chicago to Missouri River points, which is somewhat similar to the plan long existing at Kansas City, which has been on the whole quite successful. There are some differences, however. The maintenance of rates west of Chicago has an important effect on the business between the seaboard and Chicago, and if the Chicago agents succeed in the purpose they will benefit more roads than their own, and will accomplish a work which their general passenger and ticket agents and general managers and presidents, and those of their companies' eastern connections, and the officers of the Joint Executive Committee, have tried long and hard to accomplish, and yet without much success. The Chicago agreement was first formulated by the general passenger and ticket agents of the several roads concerned, but is between Chicago agents. These agents deposit certain sums of money, out of which fines for the violation of the agreement are paid. The following outline of the agreement is given in the *Chicago Tribune*:

It provides that regular tariff rates, as published in the rate sheets, shall be maintained fully and without any kind of evasion, and no road shall charge any rate without the consent of all the lines in interest. All classes of tickets sold at limited rates shall extend from starting-point to destination and in one and same form for each ticket, and shall be for continuous passage only, and the limitation shall be the limit for such tickets, except that in case of actual physical disability of the passenger, not in existence at

time of purchase of ticket, or of accident necessitating detention of trains, the line on which the delay occurs may exchange such ticket for others so limited as to enable the passenger to reach his destination without extra expense. No ticket shall be exchanged or time limit extended for or through a ticket-broker.

All special rates for round-trip, excursion, or other special forms of tickets between competitive points in the territory embraced, not provided for in the Chicago rate-sheet, shall be the subject of special agreement from time to time between the competitive lines interested; and no special rate or combination of rates shall be made so as to reduce the agreed special or regular rates between the competitive points covered by this agreement. Only holders of first-class tickets shall be transported in first-class coaches, sleeping, parlor, or chair-cars. The maximum commissions that may be paid in Chicago on any one whole ticket to the Missouri River points between Yankton and Kansas City, both inclusive and beyond, shall be \$1 on one-way tickets of any class, and \$1.50 on round-trip tickets, and no higher commission shall be paid to any intermediate point. No passenger or baggage shall be transferred free in Chicago. Any tickets dated on or after Feb. 4 sold at less than the rates provided for, or in violation of any of the provisions of the agreement, shall be redeemed by the guilty road at the following rates: For each offense, at double the par tariff or agreed value of each ticket. However, if a ticket has been sold by any person not a regular ticket agent of a railroad or transportation line at a cut rate, and the authorized ticket agent can establish the fact that he sold the same at full tariff rate, and that he did not connive with the party selling the ticket, then the price of redemption shall be only the full par or tariff value of such ticket. Any sharing of rentals with or payment of salary, side-cut or extra allowance of any nature to ticket agents or their assistants, or other parties, for the purpose of securing business to the points covered by the agreement, which shall have the effect of increasing, directly or indirectly, the amount of commission agreed upon, shall be deemed a violation of the agreement.

Theatrical rates shall be two-thirds of the first-class unlimited rates between Chicago and Missouri River points published in the current Chicago rate-sheet (subject to an agreement to be hereafter made), and must be confined to genuine theatrical people, and if tickets are sold at theatrical rates to persons or parties not entitled to theatrical rates, such tickets shall be redeemed as heretofore provided for in cases of cut-rates. No baggage shall be checked free or at less than the current extra baggage rates.

Whenever a violation of the agreement is discovered, the plaintiff must give immediate notice, with particulars of the case in writing, to the chief officer of the passenger and ticket department of the road in whose interest the violation was made, naming to him the time and place when a meeting to investigate the case will be held, which time shall in no case be later than five days after the date of discovery of the commission of the offense; and any violation of the agreement that may occur between the time of the discovery of such offense and the decision of the meeting thereon, shall be treated as of the same degree as the one for which the meeting was called. All investigations for breaches of the agreement are to be made by the general passenger agents or their regularly authorized representative, but a majority decision may be appealed to arbitration by either the plaintiff or defendant, the plaintiff to select one arbitrator, the defendant to select one, and these two to select a third, the majority decision of the three to be final. Upon the imposition of a penalty as provided in the agreement, it must be paid by the offending ticket agent, or the prescribed appeal taken at once; and if the infliction of any penalty is confirmed by the arbitrators on the evidence furnished them, the penalty so imposed, together with the costs in the case, shall be paid by the agent convicted within five days after such affirmation of judgment.

No railroad a party to the agreement can withdraw except by giving in writing five days' notice, and no such notice of withdrawal shall be recognized while charges for violation of the agreement are pending against such line.

New Differential Fares.

The following are differential fares agreed to at the late meeting of the Joint Executive Committee and that went into effect Feb. 8, which are by routes which heretofore have not had differentials:

From Indian-	By I. B. & W. and—	Class.	1.	2.
apolis to—				
Boston:	L. S. & M. S., N. Y. Cen. and B. & A.		\$19.50	\$17.50
	L. S. & M. S., Erie and Fitch.....		"	"
	L. S. & M. S., West Shore and Fitch.....		"	"
	N. Y., Pa. & O., Erie and Fitch.....		"	"
New York:	L. S. & M. S. and N. Y. Cen.		17.50	15.50
(To Albany, N. Y., Pa. & O., Erie and Fitch.....			"	"
\$17 1st class.)	L. S. & M. S. and West Shore.....		"	"
	N. Y., Pa. & O. and Erie.....		"	"
	Balt. & Ohio.....		"	"
Philadelphia:	L. S. & M. S. and Erie.....		16.50	14.25
	N. Y., Pa. & O. and Erie.....		"	"
Baltimore and	Balt. & Ohio.....		15.00	12.25
Washington:	L. S. & M. S.		12.25	10.50
Buffalo:	N. Y., Pa. & O. and Erie.....		"	"
	Balt. & Ohio.....		10.30	"
Pittsburgh:	N. Y., Pa. & O. and P. & L. E.....		"	"
	C. A. & C. P., C. T. and P. & L. E.....		"	"
	Balt. & Ohio.....		8.40	8.00
Wheeling:	By Pitts. & Lake Erie and			
Pittsburgh to	N. Y., Pa. & O. and Ch. & At.....		10.50	9.50
Chicago:	L. S. & M. S.		10.00	9.50
Indianapolis:	N. Y., Pa. & O.		10.20	"
Cincinnati:	"		18.60	18.00
St. Louis:	N. Y., Pa. & O. and O. & M.....		15.25	14.50

* Applies in both directions. † Applies to territory beyond Indianapolis and east of St. Louis. ‡ Applies to territory beyond St. Louis on west-bound travel only.

Western Trunk Lines Association.

A dispatch from Chicago, Feb. 5, says: "The general managers of the roads connected with the Western Trunk Lines Association held a meeting this morning and discussed the Utah agreement. No announcement was made as to the result, but, as near as could be arrived at, the result was this: The eastern connections of the Union Pacific absolutely refused to recognize the Utah agreement until after the Burlington shall make a satisfactory pool on all Nebraska and similar business. They were not, however, averse to getting as high rates as possible, and since the Burlington has kept to the high schedule it is understood that it was agreed to stiffen up rates some what, but without special reference to the Utah agreement. As the general freight agents of the roads interested met during the afternoon, it is understood that they held their meeting at the orders of the general freight agents to arrange a new tariff, which it is expected Commissioner Vining will promulgate to-morrow. It is said that the Rock Island has given the required 30 days' notice of withdrawal from the Northwestern Traffic Association, and that the Northwestern has given a similar notice of withdrawal from the Central Iowa Association."

Cotton Rates.

An order has been issued from the Commissioners' office reducing rates on cotton to 50 cents per 100 lbs. from Memphis to New York, and putting rates from other points on the same basis. This action is taken to meet reductions made by the lines running to New Orleans.

RAILROAD LAW.

A Heavy Verdict for Damages.

The case of David against the Boston & Albany Co. was tried in the Superior Court in Boston last week. This was an action to recover for personal injuries. The plaintiff was a passenger upon the defendant road on Dec. 7, 1882, going from Boston to Westfield. On the arrival of the train at Springfield, the train, which was made up of two divisions, was disconnected, but the defendant's servants neglected to disconnect the bell-rope, thereby causing the forward and rear cars of the train to collide. By reason of the collision the plaintiff, who was in one of the rear cars, was thrown backward against one of the seats and was injured so that his legs became paralyzed. He now sought to recover damages for the injuries received. The jury returned a verdict for the plaintiff in the sum of \$29,920.

The Law Governing Transportation of Live Stock.

In the United Court in Boston last week, in the case of the United States against the Fitchburg Railroad Co., which was a suit against the company for unlawful detaining of swine or hogs in course of transportation for more than 28 hours without unloading for rest, water or feeding. The defendants contended that the statute was unconstitutional, as it being beyond the power of Congress to enact; that it was inconsistent and repugnant in allowing the time of confinement on a connecting road to be included in the 28 hours; and that the government must prove actual knowledge of the defendant as to what had occurred on the connecting roads before it could be held liable. The Court ruled that only a single penalty can be recovered for the entire offence, but ruled against the defendant on all the other questions raised. A verdict was given for the government, but an appeal will be taken on the question of law.

The South Carolina Passenger Law.

The law regarding passenger rates recently passed by the Legislature of South Carolina, provides that no company in that state whose passenger earnings exceed \$1,200 per mile of road per year shall charge more than 3 cents per mile for each passenger. Roads earning over \$700 per mile and less than \$1,200 shall be allowed to charge 4 cents per mile. Each passenger shall be allowed to carry 100 pounds of baggage without extra charge. It is provided that for short distances where the charges by the mile will be less than 25 cents, that amount may be established as a rate of fare. The law also provides that nothing in it should be held to prevent roads from issuing mileage, excursion, commutation, or season tickets at lower rates. It also requires that all companies shall run second class or smoking cars for passage in which they shall charge at a rate not to exceed 2½ cents per mile, for railroads of the first class, and 3 cents per mile for those of the second class.

Personal Injury—Negligence.

The case of Snow against the Fitchburg Railroad Co., just decided by the Massachusetts Supreme Court, was an action to recover damages for personal injuries. At the trial in the Superior Court for Middlesex County it appeared that the plaintiff was a passenger on the defendant road, traveling from Littleton to Hudson. In making the trip the plaintiff left the cars on the main line at the South Acton station until the arrival of the express train from Boston, the last two cars of which were detached from the train and passed upon the Marlboro branch by a flying switch, while the rest of the train passed by the station on the main track without stopping. As the train on the main line passed, a mail-bag was thrown from the mail car and the plaintiff was struck and knocked down and injured. The Superior Court refused to rule that the plaintiff was not entitled to recover, and found for the plaintiff. Exceptions alleged by the defendant have now been overruled. The court says that the plaintiff was properly on the platform at the station, awaiting to make a necessary change from one train to another. The defendant was bound to exercise towards her such care and diligence as would be reasonably exercised to protect her from such injuries as human foresight could anticipate and prevent. The defendant voluntarily furnished a car to run on its express train, from which it knew that mail-bags were to be thrown, at the station where the plaintiff was, when the train was under full speed. There was evidence to show that mail-bags had not infrequently been thrown from this car in such a way as to strike on the platform where the plaintiff stood. It was within the power of the defendant to prevent the practice of throwing out mail-bags, if in no other way by withholding the use of the car, or by stopping the train at the station. The Court was justified in refusing to rule as requested by the defendant.

OLD AND NEW ROADS.

Alabama, New Orleans, Texas & Pacific Junction.—This company, which controls the Vicksburg & Meridian, the New Orleans & Northeastern, and their subordinate roads, recently announced in London a subscription for \$800,000 in 6 per cent. first-mortgage debentures having 25 years to run. These bonds make a total of \$1,500,000 issued by the company, and are offered to subscribers at 92½. The latest report is that the whole issue was taken.

Baltimore & Ohio.—On the extension of the Hemptfield Branch from Washington, Pa., to Connellsville contracts have been let to McMahon, Shannahan & Green for the tunnel at Peterman's. Another section on which there is a very heavy fill has been let to Shepard, Platt & Hoblitzel, of Pittsburgh, who are to begin work at once.

Batesville & Brinkley.—This road is now completed to Colona, Ark., 8 miles beyond the late terminus at Riverside, and 23 miles from Brinkley. An extension of 24 miles from Brinkley to Newport is in progress. The track on this road was all laid last year.

Bell's Gap.—This road is now completed to Irvona, Pa., two miles north from the lake terminus at Coalport, and 25 miles from the connection with the Pennsylvania railroad at Bell's Mills. The extension reaches a new coal mine.

Boston & Providence.—In Boston, Jan. 31, a special meeting of stockholders was held to decide as to the acceptance of the proposition made by the city of Providence in relation to terminal facilities and improvements in that city. President Whitney stated that the cost of the improvements to the Boston & Providence Co. would be \$545,000; to the New York & New England, \$600,000; to the Providence & Worcester, and to the New York, Providence & Boston, \$900,000 each. The stockholders voted that the directors be empowered to make all contracts and secure such legislation as may be needed for reconstructing stations and for improving terminal facilities, and that they would be authorized to issue bonds or notes having 20 years to run to the amount of \$600,000. The President stated that the

money would not be needed before the close of the present year.

Camden Short Line.—This company has been organized under charter granted by the South Carolina Legislature to build a road from Charlotte, Columbia & Augusta, near Winnsboro, S. C., to Camden, and thence to some point on the Cheraw & Darlington road. The distance is about 80 miles.

Canadian Pacific.—In the Dominion Parliament Feb. 1, Sir John McDonald offered resolutions to the effect that it is of the greatest importance for the settlement and development of the far West that the Canadian Pacific road should be completed by the spring of 1886, and in order to aid the company in securing sufficient capital arrangements were entered into to aid the company in the disposing of \$65,000,000 of unsold stock, which unfortunately did not succeed. The best means of preventing delay in the construction were set forth in the following resolutions: That it is expedient to provide that the government may return its securities now held under the act of incorporation, that the money subsidy hereafter payable to the company may be paid as the work on either end of the Eastern or Central section of the road proceeds, in the proportion which the work done on such section bears to the value of the whole work remaining to be done under the contract on that section. That the time of payment by the company of \$2,854,000, agreed by it, to be paid on Feb. 1, 1884, as part of the funds referred to in the agreement with the government of Nov. 7 last, should be extended to Nov. 7, 1888, when \$4,527,000, being the last installment of the fund payable by the company to the government, will fall due, and the whole sum, amounting to \$7,381,000 with interest payable half-yearly at the rate of 4 per cent. per annum shall then be paid to the government.

That the government may, out of any unappropriated money in the treasury, make a loan to the company not to exceed \$22,500,000, to be repaid by May 1, 1891, with interest at 5 per cent.; \$7,500,000 to be advanced forthwith to extinguish the present floating debt.

That as security for the repayment of this loan and the sum of \$7,381,000 falling due Nov. 1, 1888, the government shall have a first lien on the entire property of the company, saving always the right of the holders of mortgages on the extensions from Callender to Brockville and Montreal, as security for the unpaid balance of the purchase money; all money received by the government or the trustees on the land grant bonds in the redemption of such bonds shall be applied to payment of the interest of this loan, any surplus to go toward the reduction of the capital. The government shall cause an agreement to be executed providing for such conditions for securing the application of said loan to the purpose for a sum as authorized or the repayment of the said loan as may seem proper, providing that upon default for 12 months in the payment of any installment of principal or interest due under the contract the right of the company to receive any further cash or land subsidy shall cease, and all the real and personal property of the company shall without any further proceeding be vested in the Dominion of Canada and shall be taken possession of by the government.

That the company be authorized to execute an agreement of the nature of the above, provided such agreement be ratified by a vote of at least two-thirds of the stock.

That until the payment in full of the indebtedness of the company all moneys earned by the company as postal subsidy and for government transportation shall be retained by the government to be applied to the payment of interest. The stock of the company (\$35,000,000), now in the hands of the government, shall be held by it and may be sold by the company with the consent of the government, on condition that the proceeds of such sale be applied either to the improvement or extension of the road or to the repayment of the debt due the government.

That, so long as any part of the money loaned that remained unpaid in mortgage or lien of any description, shall be created upon the road or any part thereof, nor shall any stock be issued by the company in excess of the amount of \$100,000,000 above provided for.

These resolutions will undoubtedly give rise to an extended debate in Parliament.

Carolina Landing & Deer Creek.—The Mississippi Legislature has passed a charter for this road, which is to extend from Carolina Landing, on the Mississippi River, northwest about 60 miles to Deer Creek on the Louisville, New Orleans & Texas road.

Central Massachusetts.—The purchasing committee has finally settled with the trustees and the Court, and has taken a deed for the road. No arrangements have yet been made to operate the completed portion of the road, and it looks now as though it would be exceedingly difficult to raise the money necessary; the bondholders apparently being not disposed to put any more money into this project.

Chicago & Eastern Illinois.—It has been reported for some time that Mr. Jay Gould has been anxious to secure a controlling interest in this road, in order that it may be operated in the interests of the Wabash. It is said, however, that the stockholders are not willing to sell, although they probably would not object to a traffic contract. Mr. Gould recently completed the organization of a company known as the Chicago, Ritchie & Danville, which will run substantially parallel to the Chicago & Eastern Illinois; but it is said he is not desirous of building the new line, and will not do it if he can make any arrangement with the Chicago & Eastern Illinois.

Chicago, St. Paul, Minneapolis & Omaha.—Surveys have been made for a branch of this road from Neillsville, Wis., westward through Marshville to Wausau, a distance of 81 miles. A large part of the right of way has been given by landowners along the line, and it is said that the work will be begun early in the spring. This branch will open up a large section of hardwood country and will also reach some some standing pine timber.

Cincinnati, New Orleans & Texas Pacific.—The suit brought to test the liability of the company for the stock overissued by the late Secretary is on trial in Cincinnati this week. It will be remembered that Geo. F. Doughty, now deceased, while Secretary of the company issued nearly \$400,000 stock fraudulently, using for that purpose certificates from the company's stock books, which the President had signed in blank. This fraudulent stock was used by Doughty as security for loans made by him, and the over-issue was not discovered until after his death. The present case is regarded as a test case, and is brought by the Citizens' National Bank, which held some of the stock. It is stated that the bank on receiving the stock sent to the President to ask if it was good security, and he answered that the stock was good. In charging the jury the Court ruled that the fact that the certificates bore the signatures of the President and Secretary of the company, both genuine, and the corporate seal of the company, it did not establish the validity of the certificate, and that it must be determined whether the President, in saying that the certificate was good, was acting in an official capacity and by the authority of the company. The Court also charged that the rifting of the company's stock-book by the Secretary was not within

the scope of his duties, and that if the blank certificates were taken before they were filled out, then the subsequent act of filling them out and selling them was unauthorized.

Danville, Olney & Ohio River.—In the United States Circuit Court, at Springfield, Ill., last week, counsel for some of the bondholders filed a cross-bill charging that there had been an over-issue of both stock and bonds. This is denied by the trustees, who will file an answer to the cross-bill.

Delaware, Lackawanna & Western.—A Philadelphia dispatch of Feb. 6 says that "reports have been current there for some time past that Mr. Vanderbilt has been buying up the stock of this company, and that at length he has secured a controlling interest. His object, it is said, is to take the road into the Reading and New Jersey Central system, and thus form a combination which shall control the anthracite coal trade. At the Reading office profound ignorance was expressed regarding this rumor in answer to questions, but parties closely identified with Mr. Gowen said that they were satisfied that some arrangement with the Lackawanna had been or would be made, although they doubted that Mr. Vanderbilt had secured control of the stock." In New York this rumor is regarded with considerable doubt.

Denver & Rio Grande.—The Maysville Branch is now completed to Monarch, Col., 9 miles beyond the late terminus at Maysville, and 21 miles from the junction with the Leadville line at Salida. The track on this branch was laid in 1883.

Freeport & Mississippi.—Surveys have been begun for this projected line from Freeport, Ill., westward to Galena. The other party of engineers is working westward from Galena. The line is generally supposed to be in the interest of the Chicago & Northwestern.

Gettysburg & Harrisburg.—The track on this road is now all laid to Gettysburg, Pa., 22 miles southward from Hunter's Run, where the road connects with the South Mountain Branch of the Cumberland Valley road. The ballasting is in progress, and the road will probably be opened for business by March 1. It forms a pretty direct line from Harrisburg to Gettysburg, in connection with the South Mountain and the Cumberland Valley roads.

Grand Trunk.—The old suit of the Northern Transit Co. against this company is on trial in the United States Circuit Court in Milwaukee this week. The case was tried nearly two years ago, and a verdict was then rendered giving the plaintiff damages to the amount of \$114,000, but the defendants appealed and secured a new trial. The Northern Transit Co. brought the suit, claiming \$300,000 as damages for the failure of the Grand Trunk to handle promptly freight delivered to it, in accordance with certain traffic arrangements between the companies. The case is a complicated one and will take some time for trial.

Gulf, Colorado & Santa Fe.—Reports have been started of the sale of this road to Jay Gould, in the interest of the Missouri Pacific. These reports, however, have been contradicted by the officers of the company, who say that the Texas stockholders are not at all prepared to sell out to Mr. Gould, and that there is no probability of any change in the management. They also say that the company is ready to proceed with its proposed extension to a connection with the St. Louis & San Francisco road as soon as permission can be obtained from Congress to build through the Indian Territory.

Hudson Terminal.—This company, which proposes to build a line into Jersey City, with terminals on the Hudson River, has applied to the Circuit Court in Jersey City for a commission to condemn certain lands. The application was opposed by counsel for the Philadelphia & Reading and the not very Lehigh Valley roads, but was granted by the Court. It is clear what this company intends to do or in whose interest it is operating.

Indianapolis, Decatur & Springfield.—A meeting of the holders of second-mortgage bonds was held in New York, Feb. 5, when the trustees stated that the receipts of the road during the past year were \$224,554 and the disbursements \$194,493. A committee was appointed to confer with the directors of the company as to the prospects of the road, and to report at a future meeting.

The company gives notice to holders of preferred stock and new second mortgage bonds that on and after Feb. 11 the securities named would be exchanged for the original second-mortgage bonds for which they were first issued. Holders of the securities have not been satisfied, and have generally expressed a wish to reclaim their former bonds.

Kentucky Central.—It is understood that in a few days an order will be issued extending the jurisdiction of the general officers of the Chesapeake & Ohio over this road, and that it will hereafter be operated substantially as a division of the Chesapeake & Ohio, although the separate organization of the company will be maintained and its accounts will be kept separately.

An informal meeting of bondholders and stockholders of this company was held in Cincinnati Feb. 2, and those present gave their approval to a proposition to assess the stockholders 10 per cent. on the par value of their stock, and for the bondholders to agree to a reduction in interest from 6 to 4 per cent. for three years. This plan, it is believed, will enable the company to complete the extension of the road to Livingston at once, and will also make the payment of the floating debt from the earnings of the road possible. The plan will probably meet with some opposition from the smaller stockholders, but it seems to be admitted that something of the kind is necessary to enable the company to complete the extension and provide for other requirements.

Lackawanna & Pittsburgh.—This company has now completed and under operation the following lines: from Lackawanna Junction, New York, to Perkinsville, 42 miles; from Swain's to Nunda, 12 miles, and from Olean to Angelica, 40 miles. The last named line is 3 ft. gauge and the others standard gauge. The new road built by this company extends from Lackawanna Junction on the Genesee Valley road, to Angelica, 6 miles, and from Swain's to Perkinsville, on the Delaware, Lackawanna & Western road, 17 miles. The company has also changed 19 miles of road from 3 ft. gauge to standard gauge, using it as a part of its main line. The most important work on the new line is the viaduct over Stony Fork Glen, in the town of Dansville, in Steuben County. This viaduct is 700 ft. long and 237 ft. above the bed of the stream, being a little higher than the Portage bridge, the highest bridge in the state of New York. It has 12 spans of 30 ft. each, four spans of 60 ft. each and one of 100 ft., supported by iron trestle towers of the type commonly used in similar structures in this country.

The mason work of this bridge was built by Blake Bros., and by Wescott & Ames, Dansville, N. Y., and the iron work by the Delaware Bridge Co.

Lake Erie & Western.—The General Manager of this company reports that the net earnings of the road for the first five months of the current fiscal year will show a

surplus of \$102,500 over the working expenses and fixed charges.

Land Grant Case.—The St. Paul Pioneer-Press of Feb. 1, says: "On Monday next, in the United States District Court in St. Paul, a case of more than ordinary interest and importance will be called. It is in the nature of a test case, and upon the result depends the title of at least 100,000 acres of land—mostly situated along the line of the Manitoba Railroad. The defendant in the present trial is Lars Danielson, a Norwegian farmer living in Todd County, Minn. He has been a bona-fide resident of Todd County for the past fifteen years, living upon the very farm, the title of which is now in dispute, never imagining but what he was secure in his rights to his homestead. Although frugal and industrious, he has not accumulated any surplus wealth, and the present suit entails much expense and trouble upon him, even should he succeed in successfully defending the title and ownership of the property. There is no question as to Danielson being a bona-fide resident; that he has occupied the land for 15 years; that he has a patent from the government, and the tax receipts from the state and county. But the Manitoba Railroad Co. claims the land by right of ownership prior to the time it was entered by Danielson. This land came through the general government to the state of Minnesota, and was granted to the Manitoba Railroad Co. by the state Legislature. This legislation was found to be exceedingly onerous to settlers who had entered lands within the limits of the grant, and during Gov. Pillsbury's administration a commission was appointed to adjust the trouble as far as possible. The commission did everything in its power to prevent hardship to the settlers, and Gov. Pillsbury, in order to make the case of these farmers still stronger, signed a deed of relinquishment, so far as the state was concerned, to the general government for all this land. Whether or not Danielson's name was in the list embraced by the deed of relinquishment is a matter of uncertainty. At any rate, the Manitoba Co. did not sign the deed of relinquishment, and they now claim that the land legally belong to them, having been granted by the Legislature. They charge that the Interior Department has issued duplicate patents, and the fight is directed against the Interior Department, not against Danielson. The latter is unfortunately a victim of circumstances, and is selected to defend the test case. If the decision of the Court is in favor of the railroad company, Danielson and a number of other farmers lose their land, although it is the opinion of those conversant with the matter that the settlers must be reimbursed by the railroad company for the improvements that have been made upon the land."

Lehigh Valley.—The death of Mr. Harry E. Packer raises a question as to the controlling interest in this road which is held by the estate of the late Asa Packer. Mr. Harry E. Packer, who has just died, succeeded his father as President of the road and in the substantial management of the trust, but since his death the only heirs of Judge Packer surviving are the children of a daughter who are all too young to take any interest in the management. By the terms of the will, however, this trust will continue until the last of these children attains the age of 21. The chief management of the trust will now devolve on Mr. E. P. Wilbur as surviving trustee. Mr. Wilbur has been for a long time one of the directors of the road and possessed the confidence of both Judge Packer and his heirs, and upon his action depends the future of the road. It is not probable, however, that there will be any change in the management and probably very little change in the policy of the company.

Marquette, Houghton & Ontonagon.—The Boston Transcript says: "The reports in relation to a forfeiture of the Marquette, Houghton & Ontonagon land grant are in relation to a right to a land grant, which land grant the company can have if it builds to Ontonagon. The Marquette, Houghton & Ontonagon earned first by construction some years since its original land grant, which it sold to the Brasses of England for \$2,500,000 in 1881. The railroad has just earned another land grant of 80,000 acres by the construction of its Houghton Branch. It has the right to earn a third land grant by building to Ontonagon. This land grant is estimated to be worth \$1,500,000, but the construction of the road would cost nearly a million, and its operation, it is figured, would be a continuous loss. Therefore the company has accounted this as of only contingent future value, worth about the amount of effort taken now and then to secure an extension of time for the building of the road. The grant is from the United States, but the state of Michigan is trustee for it, and has extended the time for the building of the road, but another extension may be asked."

Meadville.—The purchasers at the recent foreclosure sale have organized a new company under the same name, and will take possession of this road Feb. 13. They have made arrangements for land equipment and will operate the road themselves, the lease to the Pennsylvania being set aside by the foreclosure. These purchasers were all stockholders in the old company.

Mexican Central.—In answer to the circular of this company noted last week, subscriptions have been received to the amount of over \$750,000, and it is expected that the whole amount of \$1,000,000 will be secured this week.

Milwaukee, Lake Shore & Western.—It is announced that this company will this year extend its road from Watersmeet, Mich., to the Montreal River, the boundary line between Michigan and Wisconsin. The company expects to make connection with the Northern Pacific, and will build from the Montreal River to Ashland, Wis., also, unless the Northern Pacific should extend its Wisconsin Division east of Ashland.

Missouri Lumber & Mining Co.—This company has begun the construction of a narrow-gauge road starting from Cutler in Wayne County, Mo., on the Iron Mountain road, and running across Black River and up Little Brush Creek 16 miles, in order to reach a large body of pine lumber which is owned by the company.

Mobile & Ohio.—This company makes the following statement for the month of January:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings	\$185,539	\$210,212	D.	\$20,673 14.2
Expenses	140,000	145,369	D.	5,369 3.7
Net earnings	\$45,539	\$70,843	D.	\$25,304 35.6
Per cent. of expenses	76.0	67.3	I.	8.7

The decrease in earnings is chiefly due to the falling off in cotton traffic on account of lighter crops along the line.

Mount Desert.—The Railroad Commissioners of Maine, after hearing the arguments on both sides, have granted their approval of the proposed railroad from Bar Harbor to the foot of Green Mountain on the island of Mt. Desert. The Commissioners say they are satisfied the public convenience requires such a road. They think that the objections made to its construction through the village of Bar Harbor are well founded, and that the company should stop its road at a point where it will not interfere with the access to the shore from that village. While it would undoubtedly be convenient to have the road built to a point where it can

make close connection with the steamboats they do not think that the public convenience demands it, and the proposed route would certainly interfere with the enjoyment of the shore front which is the chief purpose for which people resort to Bar Harbor.

New York & Boston Inland.—The organization of this company in Connecticut has lapsed, the company having failed to begin work within the period fixed by law. Under the terms of the law its corporate existence ended Feb. 4.

New York & Connecticut Air Line.—Work on this road, which was begun last week, is being pushed with a great show of energy. In addition to the points named last week gangs of laborers have been put to work at Orange and Milford and those already at work at Bridgeport, Southport and Stamford have been increased. The parties in charge of the work state that there is no intention to limit the amount done with that required by law by the company, as work was begun with the intention of carrying the road to completion. It is said that the company will try and make arrangements to use the New Haven & Derby road out of New Haven.

New York & Long Branch.—The suit of the Pennsylvania Railroad Co. against this company, the Reading and the New Jersey Central, came up again in the United States Circuit Court at Trenton, Feb. 5. A large body of testimony was introduced, but it contains nothing especially new.

New York & New England.—The Finance Committee of the Connecticut Legislature has voted unanimously to report unfavorably on the petition of this company for an abatement of taxes due to the state.

In Boston, Jan. 31, a petition was presented by this company asking for the passage of a bill by the Massachusetts Legislature to allow the issue of \$5,000,000 preferred stock.

This stock is to be paid for wholly in cash or to be at the rate of \$50 in cash and two shares of common stock for each share of the new stock. The second mortgage bonds may also be exchanged for new stock. Receiver Clark appeared before the Railroad Committee and testified that while the road cannot earn its fixed charges at present he believed that in the course of a few years it would be able to meet all its liabilities.

Before the Railroad Committee and Receiver Clark expressed his opinion on the present condition and prospects of this property at some length. He said that the company now owns 326 miles of main track and leases 119 miles of road besides controlling the steamboat line from Norwich to New York. Only one expenditure of large amount is needed on the road at present and that is the extension of the second track about 40 miles between Blackstone and Williamstown, part of the work upon which is done. To complete this second track will require about \$386,000. The company has sufficient equipment for its present needs, and no further expenditures for this purpose will be needed except the annual payments required by the car trusts. As to terminal facilities he thought that the company had made sufficient provision both in Boston and at other points. It only remains to pay the bonded and other debts which have been incurred in buying for this property. Most of this debt will not mature for several years and, there is no need of any provision being made for its payment at present. It is to the interest of both stockholders and bondholders that the second track above referred to should be completed as soon as possible in order that the road may be worked economically and that the money already expended on it may not be lost. Mr. Clark thought that a great mistake had been made in trying to compete for through business. He said that in investigating the facts in relation to the traffic of the road he had found that its connections had dealt with it fairly and that the Erie road, in connection with which one-third of the freight business was done last year, had given its fair and due proportion of the through rate, and nothing more could be asked of it. In doing this through business, however, he had found as near as he could estimate that there had been an expenditure of \$225 to earn \$100. He thought that by renouncing this through business and saving the money, which according to his ideas had been thrown away in doing it, he would be enabled to save one-half of the amount needed to pay the fixed charges of the road. It was this through business which had brought up the percentage of working expenses so high more than anything else. He also hoped to secure some reduction in the cost per train mile, which he regarded as the true test in the economic operation of railroads, and he had no doubt that in the course of two or three years the road would be able to earn all its fixed charges, but this must be done by getting business which could be done at a profit and not by trying to increase the volume of business without any regard to its cost. The road, he said, serves a useful purpose in Southern New England between Boston and the Hudson River. It has a local business of its own which if fairly treated will grow and pay well. When this business has developed and the unprofitable business has been cut off and the expenses reduced he thought that the road would become a valuable property.

Mr. Clark, it is well known, was formerly connected with the road, but was not in favor of the connection with the Erie and the entering into competition for through business.

New York, West Shore & Buffalo.—The committee appointed to adjust the accounts between this company and the North River Construction Co. has begun its meetings. The settlements of the accounts will probably take some time.

The Syracuse Courier publishes the opinion of an eminent lawyer, whose name is not given, in relation to the rights of the contractors who have built this road and their remedies against the company and the North River Construction Co. The principal points in this opinion, which is very elaborate, are that, as the contract between the West Shore and the construction company was executed before the consolidation of the present New York, West Shore & Buffalo Co., and as the articles of consolidation provided that the obligations incurred by the consolidated companies, among which was the contract in question, should be so made and assured by the new company there was both constructive and actual notice to every body of the nature of these obligations, of the rights of the construction company and its claim to the ownership and possession of the property, and that the mortgage securing to the \$50,000,000 bonds having been executed after the consolidation, and mainly upon property to be acquired, it is subject to the claims of the contractors for the labor and material which they have put into the road. In other words, that the amount due and unpaid for the building and equipment of the road are a lien upon the property superior to that of the first mortgage. This is, of course, merely an opinion, and will have to stand test of the courts.

Warren Currier, a holder of stock and bonds in this company, has brought suit against this company and the North River Construction Co. to make them show cause why the construction company and its Receiver should not be restrained from selling or removing from the city any of its property, especially stock and bonds of the West Shore Co., and why the officers and contractors of the railroad company should not be restrained from doing anything under

the contract between the two companies and from proceeding with any settlement of accounts, and why the stock and bonds should not be placed in the custody of the Court. The complaint alleges conspiracy to operate the road for the benefit of the construction company. The Court granted an order to show cause returnable Feb. 15.

Oregon Railway & Navigation Co.—The issue of the new consolidated mortgage bonds of this company is delayed on account, it is stated, of a law which was passed last year by the Oregon Legislature. The law, which was intended to place restrictions on the mortgaging of private property, requires all mortgages to be recorded in each county wherein the property or any parts may be, and also subjects mortgages to taxation in each county. It is said that this law was not intended to apply to railroad companies, but by its terms it covers all real property of every description, whether owned by corporations or private individuals. Application will be made to the Legislature at its next session to amend the law so as to exempt railroad companies, to which it is understood there will be no objection; but in the meantime it will not be possible to execute the new mortgage without subjecting the company to full taxation in each county through which the road runs. Bonds will probably not be issued for this reason, and the company will have to carry a floating debt for a year. The credit of this company, however, is pretty good, and money can probably be raised without difficulty. The same law applies to the second mortgage bonds of the Oregon & California railroad, which were issued after its passage.

Owensboro & Nashville.—This road is now completed to Adairsville, Ky., close to the Tennessee line, 42 miles beyond the terminus at Ricedale, and 84 miles from the Ohio River at Owensboro. It is controlled, but not operated, by the Louisville & Nashville.

Philadelphia & Reading.—This company's statement for December, the first month of its fiscal year, is as follows, the earnings and expenses of the leased Central Railroad of New Jersey being included in 1893, but not in 1892, when that road was not worked by the Reading Co.:

Railroad Co.	1893.	1892.	Inc. or Dec.	P. C.
Earnings	\$2,297,043	\$1,795,372	I. \$502,271	28.0
Expenses	1,412,086	956,781	I. 455,323	47.6
Net earnings	\$885,557	\$838,600	I. \$46,948	5.6
Coal & Iron Co.				
Earnings	\$1,110,456	\$1,099,829	I. \$10,627	3.8
Expenses	1,216,566	1,064,955	I. 151,611	14.3
Net earnings	\$108,110*	\$5,174		
Both companies:				
Earnings	\$3,408,099	\$2,895,201	I. \$542,898	18.9
Expenses	2,628,552	2,021,418	I. 607,234	30.0
Net earnings	\$779,447	\$843,783	D. \$64,336	7.6

*Deficit.

In December, 1893, the expenses of the railroad were 61.5 per cent. of gross earnings, while those of the coal property were 109.4 per cent.

The expenses as given above contain nothing for interest or rentals, the net earnings being the amount from which those charges are to be made.

The sources of earnings of the Reading Railroad Co. were as follows:

	Earnings.	Expenses.	Profit or loss.
Railroad traffic	\$2,226,459	\$1,334,377	P. \$892,122
Canal traffic	16,582	42,581	L. 26,019
Steam coaliers	49,532	27,989	P. 21,543
Richmond barges	5,090	7,179	L. 2,089
Total	\$2,297,043	\$1,412,086	P. \$885,557

The canal and the Richmond coal barges are always sources of expense at this season.

The earnings of the Reading lines proper and of the New Jersey Central for the month were as follows:

	Reading.	Central.	Total.
Earnings	\$1,591,802	\$735,841	\$2,297,643
Expenses	946,540	465,546	1,412,086
Net earnings	\$645,262	\$270,295	\$885,557
Central rental		484,091	484,091
Profit or loss		L. \$213,796	P. \$401,496

The Reading lines proper, excluding the Central, thus show for the month a decrease of \$233,571, or 13.0 per cent., in gross earnings; a decrease of \$10,223, or 1.1 per cent., in expenses, and a resulting decrease in net earnings of \$223,348, or 26.1 per cent., which was doubtless chiefly due to the reduction in coal traffic.

The traffic reported on the railroad was as follows for the month:

	1893.	1892.
Passengers	1,058,133	782,218
Tons merchandise	512,993	146,680
Tons coal	492,382	327,877
Tons coal on colliers	46,631	46,631

This shows that on the Reading lines proper there was a slight increase in passenger traffic; a slight decrease in merchandise tonnage, and a considerable decrease in coal tonnage.

From November to May are the months of lightest traffic and earnings on the Central lines.

The coal mined from the lands of the Philadelphia & Reading Coal & Iron Co. for the month was as follows:

	1893.	1892.	Decrease.	P. C.
By Company	376,720	342,057	55,337	16.2
By tenants	88,657	120,424	31,767	26.4
Total	465,377	462,481	2,896	0.6

The month in 1893 included a period of half-time working. If all the coal mined passed over the railroad, it constituted 76 per cent. of the total tonnage of the Reading lines proper.

Pottsville & Mahanoy.—The track laid last week in Pottsville by the Philadelphia & Reading Co. on the ground selected by this company for an entrance in Pottsville was torn up by the city authorities. An application being made for an injunction by the Reading Co. the Court refused it, holding that the action of the town authorities did not destroy any of the rights of the parties. They would remain as they were before and until the final determination by the courts.

Providence & Worcester.—At the annual meeting in Providence Feb. 4 the stockholders directed the directors to take all the necessary measures to carry out the plans of the commission for terminal improvements in the city of Providence and to borrow the money necessary.

Richmond & Allegheny.—The committee representing the first mortgage bondholders has prepared and submitted a plan for reorganization without foreclosure. The plan has not yet been formally accepted by the parties interested, but is understood to meet the views of a majority of them. It is proposed that the first mortgage bondholders shall consent to receive 8 1/4 per cent. interest on their bonds for four years, after which the full rate will be paid; and that holders of second mortgage bonds shall surrender their bonds and receive instead preferred stock of an equal

amount. The stockholders are to be assessed 10 per cent. on their holdings, receiving in return for the money thus contributed preferred stock to twice the amount of the assessment. It is thought by the committee that enough money can be raised in this way to pay off the floating debt, and that the road will be able to earn the interest on the first mortgage bonds. To do this, however, its earnings must increase very largely.

Richmond & Danville.—At a special meeting of the Merchants & Manufacturers' Association, in Baltimore, Jan. 31, Mr. Smith, the President of the association, stated that the negotiations which have been going on with the Richmond & Danville would enable the city of Baltimore to compete with northern cities for southern trade had been, it was thought, satisfactorily arranged and that an agreement had been transmitted to New York for signature by the officers of the company. Much to the surprise of the association's committee the document was returned unsigned, and another was substituted, for what the committee considered the most important clause in the original proposition omitted, viz.: fixing differential rates, which had been excluded and a clause inserted leaving the question of differential rates with an arbitration committee. This latter proposition was not acceptable and the association would not abandon its position, but would look elsewhere for expression if necessary. The transportation committee submitted to the consideration of the association a bill to be presented to the Legislature authorizing the city to loan to the Richmond & Danville or such other company as may be deemed most advantageous, the sum of \$2,000,000 for the sole purpose of establishing and maintaining proper connection and freight rates with the city; said bill to be submitted to the voters of Baltimore for adoption or rejection. This proposition was adopted.

Rochester & Pittsburgh.—The second or consolidated mortgage executed by this company, to secure the issue of \$4,000,000 new bonds, has been duly executed and put on record. It is dated Feb. 1, and is made to the Union Trust Co. of New York as trustee.

St. Louis, Hannibal & Keokuk.—In the United States Circuit Court in St. Louis, Feb. 6, application was made by D. C. Blair, trustee, for a foreclosure of the first mortgage on this road. The road extends from Hannibal, Mo., to Gilmore, 86 miles, and the bonded debt is \$981,000. A majority of the bonds are held by John I. Blair and the estate of Moses Taylor.

St. Louis, Iron Mountain & Southern.—The Arkansas Supreme Court has decided that by the consolidation of the St. Louis & Iron Mountain and the Cairo & Fulton companies the exemption from taxation which was conferred by the charter of the old Cairo & Fulton Co. was forfeited, and that company can now claim no exemption from taxation in that state. The company has given notice of appeal to the United States Supreme Court.

South Florida.—This line will be open for business Feb. 11 from Sanford, Fla., through to Tampa, 115 miles, thus completing the gap in the through line from Jacksonville to Tampa. The new portion of the road opens up a considerable section of the interior of Florida to settlement, and the road will also make connection at Tampa with steamers for Havana and other points in the West Indies, making, it is claimed, the shortest and quickest route from New York to Cuba.

South Pennsylvania.—Two sections of heavy grading near Everett, Pa., have recently been let to McMahon, Shanahan & Green. Fourteen miles from Laurel Hill tunnel have been let to P. & T. Collins, who have also the contract for the Quemahoning tunnel.

Toledo, Cincinnati & St. Louis.—The Boston Advertiser of Feb. 5 says: "Mr. John Felt Osgood, who has returned from his inspection of the Toledo, Cincinnati & St. Louis Railroad, says that the system is in a poor condition; that fully 240 miles of track—which is now laid with light iron—will have to be reconstructed, and that other improvements also are greatly needed. The experts who accompanied Mr. Osgood are engaged in preparing their report, and not until this is completed will it be possible to say what amount of receiver's certificates will be required to put the line into suitable condition for profitable operation. Owing to the extreme cold weather of last month and other causes, the earnings for that period are understood to have fallen off considerably."

The Court has authorized the Receiver to issue \$100,000 additional certificates, the proceeds of which are to be used in payment of current working expenses of the road.

Union Pacific.—On Feb. 1 trains began running over the new cut-off or high level line, as it is called, of this company's Denver & South Park Division. The new line leaves the main line of that division at Como and runs through Breckenridge to Leadville. The distance by it from Denver to Leadville is 151 miles, or 20 miles less than by the old line. Through trains with sleeping cars will be run daily between Denver and Leadville. The new cut-off also gives the Union Pacific a line to Leadville entirely on its own tracks, avoiding the use of the Denver & Rio Grande track which was required by the old line.

Track on the Beatrice Extension of this company's Omaha & Republican Valley line is now all laid to Beatrice, Neb., 39 miles southward from the late terminus at Lincoln, and 50 miles from Valparaiso. This extension completes a cross-cut from the main line of the Omaha & Republican Valley road at Valparaiso, Neb., southward through Lincoln and Beatrice to Marysville, Kan., on the St. Joseph & Western line. The work of ballasting is in progress, and the extension will be opened for business about the end of the present month.

United States Rolling Stock Co.—The annual meeting was held in New York Feb. 5, when the trustees reported that the usual dividend of 5 per cent. had been paid from the earnings of the past year, and in addition \$50,000 had been transferred to the reserve fund.

Vicksburg, Shreveport & Pacific.—The track is now laid to Arcadia, La., 51 miles west of Monroe and 124 miles from the Mississippi. Arcadia is about half-way between Monroe and Shreveport, and is a town of considerable local business. The grading between Arcadia and Shreveport is very nearly finished, and the work on the bridge over the Red River is well advanced.

Wabash, St. Louis & Pacific.—A special meeting of this company, which has been called, is for the purpose, it is understood, of confirming the action of the directors in issuing the collateral trust bonds. It is stated that the company has recently sold \$5,000,000 of these bonds, guaranteed by the Iron Mountain Co., at 90, and the greater part of the proceeds are to be applied to the payment of the floating debt.

Wetzel & Tyler.—This company has been organized to build a narrow-gauge railroad from New Martinsville, West Va., by the easiest route to a point near the mouth of McElroy Creek in Tyler County. The office of the company will be at Middlebourne, Tyler County, West Va.